IRON TRADE REVIEW
Registered U. S. Patent Office
The Authority of Industry National and International
Vol. LXXIV Cleveland, June 26, 1924 No. 26

Sentiment Turns For Better

Steel Market Reflects More Expectant Tone As Operations Become Balanced and Prices Are Steadier—Improvement in New Buying Still Slight—Structural Market Active—Pig Iron Sales Exceed 500,000 Tons

EVENTS of the week have further strengthened previous indications that the low point of the recent relapse of the steel market has been reached or passed. Sentiment, unmistakably has turned upward though it has not brought out any appreciable increase in the general round of new business and the revival of buying seems likely to come very gradually. The greater stability of the situation apparently can be attributed to the complete way in which production has been brought into line with falling consumption. So far as can be determined, little unsold tonnage has been accmuulated in the process to be liquidated when the market could absorb it.

Operations are holding their own at 45 to 50 per cent and in some districts show slight increases. In the Mahoning valley after being down to 15 per cent a week ago, sheet production is up to 41 per cent. Steelworks capacity in that territory is 10 per cent better engaged than last week. Some unimportant changes have taken place at Pittsburgh and at Chicago the record shows a further small loss. A number of plants, particularly of the sheet and tin plate group, will discontinue July 1 or later for their customary summer shutdown over the Fourth. These suspensions in some cases will last two weeks or longer as conditions require.

Building Jobs Attracted

Attractiveness of the plain material and fabricated market is the appeal to a continuing large number of buyers of building steel. New business of this kind is in marked contrast to the dullness in other parts of the steel market. Some buyers in order to get the advantage of present structural prices are placing orders for steel in advance of general contracts. This is causing future tonnage to accumulate on fabricators' books. Structural steel awards reported this week totaled 41 with an aggregate of 34,144 tons. The tonnage placed is the largest in nine weeks. New inquiry totaled 27,800 tons. Of the new awards New York contributed 20,000 tons including 7500 tons for the Brooklyn municipal market.

Reinforcing bar awards also were the best in over two months with 6600 tons placed for 14 jobs.

Iron Sales Run High

Pig iron sales have continued to mount and the total for the movement since June 1 is at least 500,000 to 600,000 tons. Furnace interests located at Cleveland have disposed of 200,000 to 250,000 tons, Chicago reports 150,000 tons taken, Buffalo, eastern and Pittsburgh district furnaces have booked liberally and fair business has been done in the Cincinnati, St. Louis, New England and southern zones. The principal transaction of the week was 22,000 tons placed by a Pittsburgh sanitaryware manufacturer. The price line has been well sustained at some selling centers but at others has dipped further until $19 has appeared in the valleys, at Cleveland, in the South and at Chicago. A report that $18 valley basis was done on basic lacks confirmation.

Falling off of earnings has caused various railroads to cut down replacement work. This is checking new buying and is holding up delivery of rail and track material tonnage previously placed although at Chicago the mills have been able to effect some releases of this business. The Seaboard Air Line has added an inquiry for 30 locomotives to that for 55 issued by the New York Central.

Some further releases of suspended orders have come from the automobile industry but except in the case of one sheet maker, have not involved much tonnage.

Steel Prices Easier

Steel prices, considered as a whole, are steadier but still subject to shading on attractive business. In some lines, notably lap welded and seamless boiler tubes, price cutting has gone to lengths not seen in years and this has amounted to fully 10 points or $20 per ton under published discounts. Warehouse prices in leading distributing centers have been reduced $2 to $5 per ton to harmonize with recent mill changes.

Wholly due to pig iron weakness. IRON TRADE REVIEW composite of fourteen leading iron and steel products has declined again this week to $40.37 against $40.55 last week. This index still is the lowest since December, 1922.

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The Reader's Page

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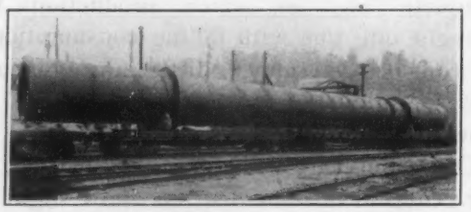
Aiding Readers With Tax Problems

TWO timely articles of particular importance to readers are those relating to the new income tax law, prepared for Iron Trade Review by an expert on tax matters and a certified public accountant. At the time of the passage of the original Act of 1921 Iron Trade Review filled a general demand by presenting a series of articles to aid



Build Rotary Kiln 125 Feet Long. Page 1690.

its readers to understand the provisions. The interest displayed was so great that an expert analysis of the changes made in the bill recently signed by President Coolidge, now is offered. The articles deal with the essential requirements of the law. The first of the series was presented in the June 12 issue. The second, in this issue, is devoted to an analytical study of the law as it affects individuals. Should any additional information be desired, and requested for explanation or amplification, these will be answered by the author of the articles through the columns of Iron Trade Review.

Do You Know That—

Invaluable market and technical information makes IRON TRADE REVIEW essential to every branch of the metalworking industry. IRON TRADE REVIEW'S readers represent an annual potential buying power of billions of dollars.

Pig Iron Selling in Large Volume—Sanitary Ware Maker Buys 22,000 Tons—Prices Stabilizing Around $19

PITTSBURGH, June 24.—The feature of the pig iron market this week are purchases by the Standard Sanitary Mfg. Co., aggregating 22,000 tons of No. 2 and No. 2X foundry iron for Allegheny and New Brighton, Pa., delivery over the third quarter. The purchase was made from several sources at $19, valley, for the No. 2 grade. Four to five thousand tons of that tonnage is to be furnished by a Pennsylvania furnace having a slight freight advantage. The Titusville Iron Works, Titusville, Pa., did not buy and still is negotiating for 500 tons each of No. 2 and No. 3 iron. It has been quoted $19, valley, base. Some merchant producers still are quoting $19.50, valley, on small lots of No. 2 iron. Definite details regarding the American Steel Foundries; purchase of 300 tons of 3 basic for Alliance, O., are not available here. It is reported placed at $19.13, delivered, which would figure back to a lower valley basis, than anything yet reported. The Allegheny Steel Co. is understood to have purchased 3000 tons of basic below $19, valley, which price now is openly quoted. Bessemer has declined 50 cents. The Reliance Steel Casting Co. bought 300 tons at $21, valley. Three other purchasers closed for an aggregate of 250 tons at the same figure. The Wheeling Mould & Foundry Co. still is negotiating for 1000 tons each of bessemer and low phosphorus iron. The United Engineering & Foundry Co.'s inquiry for 1000 tons of low phosphorus iron still is pending. Valley low phosphorus, copper free iron is quoted $28 to $29. The Bethlehem Steel Co. is quoting $24, Lebanon, for copper-bearing iron. Other eastern furnaces are quoting $23, furnaces, on copper-free iron. One sale of 150 tons of malleable is noted at $19.50, valley.

More Buying at Boston

Boston, June 24.—In tonnage sold, the past week has been one of the most active of the year. The H. B. Smith Co., Westfield, Mass., bought from 7000 to 10,000 tons. The Chapman Valve Co. Indian Orchard, Mass., bought close to 1500 tons. A stove manufacturer bought 500 tons and many scattered lots of 300 and 400 tons were placed. Inquiry points to considerably more buying. A western Massachusetts consumer is in the market for 500 tons. Several Connecticut melters are asking for tonnages ranging from 200 to 500 tons and an increasing number of small foundries have expressed expectation of buying before the first of July. Prices continue low. One eastern Pennsylvania furnace sold No. 2X (2.25–2.75 silicon) at a price which figures to $23.75, delivered. Sales considerably below $20, eastern Pennsylvania furnace, for the base grade have been made. Buffalo iron has been offered at $19, furnace, for No. 2X grade (2.25–2.25 silicon). There are signs of an upward reaction. One furnace which quoted a low figure against a heavy tonnage and did not obtain the order has since advanced its price by 50 cents. Other furnaces have advanced or strengthened prices during the last few days.

Prices Are Firmer

New York, June 24.—Pig iron buying continues brisk, although the total is not as large as in recent weeks. There are just as many orders numerically, but the tonnages are smaller. The total placed in this territory during the past week aggregated about 10,000 tons, while new inquiries aggregate about 5000 tons. Prices reflect a firmer tone. On Buffalo iron sellers generally are holding for $19, furnace, for the base grade, plus 50 cents differentials for silicon and at least one Buffalo maker is asking $19.50 base. Eastern foundry iron continues to be quoted at $20 to $21, furnace, although anything lower than $20.50 base is exceptional. The Warren Foundry & Machine Co., Phillipsburg, N. J., did not buy as much iron as reported in last week's IRON TRADE REVIEW. This company bought between 10,000 and 12,000 tons. The Thatcher Furnace Co., Newark, recently placed 2000 tons. A better tone prevails among foundrymen owing to an increase in the demand for castings during the past week or two.

Market Is Less Active

Philadelphia, June 24.—The pig iron market in eastern Pennsylvania is reverting to dullness. Bookings in the past week were comparatively small and current inquiry is light. Prices are somewhat firmer. Anything under $20.50, furnace, for foundry iron is exceptional. Moderate lots of copper-bearing, low phosphorus iron were sold. The latter now is $24.50, furnace, with silicon differentials. J. L. Mott, Trenton, N. J., recently bought 2000 tons of foundry iron.

Prices More Stable

Buffalo, June 24.—Inquiry is pending for 20,000 to 25,000 tons of pig iron. This includes two lots of 2000 tons, one of 1500 and half a dozen of 1000 tons, practically all being for basic and foundry. Illinois consumers are among those who have inquiries before Buffalo makers, but it is scarcely possible their business will be placed here. The price tendency is firmer. The range is from $19 to $19.50 on No. 2 plain, from $19 to $20 on No. 2X and from $19.50 to $20.50 on No. 1X. Increased efforts are being made by furnaces to get full differentials, according to reports. Sales have been substantial during the past week, having aggregated 15,000 to 20,000 tons. Eight furnaces are operating in this district and production may be cut to seven before the end of the quarter, it is reported.

Good Sales Continue

Cleveland, June 24.—Furnaces represented in the northern Ohio group with headquarters in Cleveland have fairly good order books for the third quarter as the result of recent activity in the pig iron market. The buying movement this month has netted this group 250,000 to 300,000 tons. Good sales continue to be made, several lots ranging from 5000 to 15,000 tons having been closed in the last few days. The sale of 25,000 tons to one user is noted among recent bookings. While immediate Cleveland territory is one of the slowest of the markets in the territory covered by furnaces with headquarters here, the last week has developed business for one maker amounting to 10,000 tons. Some of the large foundries here on automobile production work are operating short time and have unused tonnage to run them into the third quarter. The principal activity has been in the northern Ohio districts and Indiana, with good size sales also reported in southern Ohio. Melters in the Indianapolis district closed for around 15,000 tons in the last week, not including the sale to the National Malleable & Steel Castings Co. previously reported. Some buyers are taking advantage of present price of-

fers to cover a portion of their needs for the fourth quarter. Valley furnaces have been selling into nearby territory in competition with Cleveland makers, and some attractive prices have developed. On recent business $19, Cleveland furnace, has been quoted. The lake furnace price generally is $20. Valley furnaces are asking $19 to $19.50, Cleveland.

The Dover O., furnace of the M. A. Hanna Co. has been blown out for repairs.

Chicago Sales Steady

Chicago, June 24.—Buying of northern foundry and malleable iron continues practically unabated and is going into northern iron since the present movement began is approximating 150,000 tons and the outlook is for continued activity through this week at least.

Selling Low in Southern Ohio

Cincinnati, June 24.—While northern pig iron seems to hold firmly at $20, Ironton, several southern Ohio furnaces are waging a price war in an attempt to obtain the meager tonnage offered by local melters. Northern iron has been sold under $20, Ironton, where furnace interests met the competition of the lake furnaces. Considerable lake iron was sold in this district recently $1 under the prevailing Ironton market price. Buying is quiet throughout this

of small lots for prompt shipment and lower prices are the outstanding features in the pigiron situation. An East Side steelmaker purchased 2000 to 3000 tons of northern basic in the Chicago district at a price which figured back to $19, furnace. This was $2 under the current quotation. A number of small lots have sold on a basis of $20, Chicago. Any quantity of foundry iron may be had at the latter price. Southern iron also has slipped sharply, two furnace interests in that section quoting $18, Birmingham base. Other southern makers are nominally at $19 to $20, but little tonnage is being placed in that range. The leading local producer quotes $22.50 to $23, but is understood to be meeting com-

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	June 25, 1924	May, 1924	Mar., 1924	June, 1923
PIG IRON				
Bessemer, valley del., Pitts.	$22.76	24.06	24.86	30.27
Basic, valley	20.00	20.70	22.00	27.35
Basic, eastern del., eastern Pa.	20.50	20.75	21.50	28.14
*No. 2 foundry, del. Pitts.	20.76	22.66	24.26	29.52
No. 2 foundry, Chicago	20.50	22.80	24.50	31.25
*Southern No. 2, Birmingham	19.00	21.65	23.00	26.75
*Southern Ohio, No. 2, Ironton	20.00	22.50	23.50	28.25
**No. 2X, Virginia furnace	25.50	25.50	26.00	28.00
**No. 2X, eastern, del. Phila.	21.76	22.60	24.13	28.25
Malleable, valley	19.50	21.30	22.50	30.60
Malleable, Chicago	20.50	22.80	24.50	31.25
Lake Superior charcoal, Chicago	29.04	29.04	29.04	36.65
Gray forge, val., del. Pittsburgh	20.26	23.26	24.26	29.02
Ferromanganese, del., Pitts.	112.29	112.29	112.29	129.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	40.00	40.60	42.50	42.90
Sheet bars, open-hearth, Pitts.	40.00	40.60	42.50	42.90
Billets, bessemer, Pittsburgh	38.00	39.20	40.00	42.90
Billets, open-hearth, Pittsburgh	38.00	39.20	40.00	42.90
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.15	2.25	2.40	2.40
Steel bars, Chicago	2.25	2.35	2.50	2.50
Steel bars, Philadelphia	2.52	2.57	2.67	2.745

	June 25, 1924	May, 1924	Mar., 1924	June, 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.42	2.47	2.57	2.72
Iron bars, Chicago mills	2.25	2.28	2.40	2.60
Beams, Pittsburgh	2.15	2.25	2.50	2.50
Beams, Philadelphia	2.42	2.42	2.62	2.82
Beams, Chicago	2.45	2.45	2.60	2.60
Tank plates, Pittsburgh	2.15	2.25	2.40	2.50
Tank plates, Philadelphia	2.32	2.42	2.57	2.845
Tank plates, Chicago	2.45	2.45	2.60	2.60
Sheets, blk., No. 28, Pittsburgh	3.65	3.65	3.75	3.85
Sheets, blue anl., No. 10, Pitts.	2.80	2.80	2.95	3.00
Sheets, galv., No. 28, Pittsburgh	4.80	4.80	4.90	5.00
Wire nails, Pittsburgh	2.90	2.95	3.00	3.00
COKE				
Connellsville furnace, ovens	3.00	3.35	4.05	4.65
Connellsville foundry, ovens	4.00	4.30	4.85	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	16.50	15.40	19.75	20.50
Heavy melting steel, eastern Pa.	15.50	14.70	17.00	18.65
Heavy melting steel, Chicago	13.50	13.75	16.70	17.75
No. 1 wrought, eastern Pa.	17.75	17.75	19.00	22.75
No. 1 wrought, Chicago	13.25	13.60	16.05	16.95
Rails for rolling, Chicago	14.25	15.30	19.30	19.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

June 25, 1924	June 18, 1924	May, 1924	Mar., 1924	June, 1923	June, 1914
$40.37	$40.55	$41.38	$43.24	$46.46	$22.58

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

its third week at the rate of 50,000 tons weekly. It is becoming more evident that this buying is mostly through the last half, indicating confidence in present prices; also, that foundries are buying iron now more on the basis of price than actual business on their books. The most general quotation is $20.50, furnace. A few sales of $20 iron have been made but they have usually represented some unusual circumstance. Inquiries and sales of 1000 tons are numerous. An inquiry of this size is out from a Michigan buyer for southern iron, which ranges from $19.50 to $20.50, Birmingham. An Illinois melter is seeking 300 tons of high silicon foundry iron. Charcoal iron sales are light but still at the level of $26, furnace. While much gloom can be derived from the low rate of operations of most foundries, an optimistic note prevails. Buying of district, although foundry activity appears at least holding its own. Sales range from a carload to 1900 tons. The Hamilton Foundry & Machine Co., Hamilton, O., is reported to have bought 1900 tons of foundry iron from a lake furnace interest for third quarter delivery. The Superior Gas Engine Co., Springfield, O., took 1500 tons of foundry iron from an Ironton furnace for third quarter, while another furnace interest in that district sold 1000 tons of the same grade to the Standard Sanitary Mfg. Co., for Louisville. The Lavelle Foundries Co., Anderson, Ind. closed for 1250 tons of foundry for third quarter. The business was placed with two southern Ohio furnace interests, one receiving 750 tons and the other 500 tons.

Prices Still Soft

St. Louis, June 24.—Scattered sales

petition.

Southern Market Slightly Better

Birmingham, Ala., June 24.—While furnace interests in the South report that indications point to a little improvement in the pig iron market, the Woodward Iron Co. and Sloss-Sheffield Steel & Iron Co. are considering blowing out one furnace each by July 1. Quotations are on a level of $20 to $21 for No. 2 foundry iron. Inquiries are more numerous, but are not developing much business. Local consumption continues to lag, although pressure pipe and radiator makers are melting iron steadily. Furnace interests say that none of the pig iron consumers in this district has purchased much iron ahead. Price reductions in the Middle West practically preclude southern competition. The third furnace for June has been banked.

Iron and Steel Prices

SCRAP PRICES, PAGE 1718; WAREHOUSE, PAGE 1740; ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1714

Pig Iron

Prices per gross ton

Bessemer, valley	$21.00
Bessemer, Pittsburgh	22.76
Basic, valley	20.00
Basic, Pittsburgh	20.76
Basic, Buffalo	19.00 to 20.00
Basic, del., eastern Pa.	20.50 to 20.75
Malleable, valley	19.50
Malleable, Pittsburgh	21.26
Malleable, Chicago	20.50
Malleable, Buffalo	19.00 to 20.00
Malleable, del., eastern Pa.	22.00 to 23.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	21.76 to 22.76
No. 1X, Buffalo	19.50 to 20.50
No. 1 foundry, Chicago	21.00
No. 2 foundry, valley	19.00 to 19.50
No. 2 foundry, Pittsburgh	20.76 to 21.26
No. 2 foundry, Buffalo	19.00 to 19.50
No. 2 foundry, Chicago	20.50
No. 2 foundry, Granite City	22.50 to 23.00
No. 2 foundry, Ironton fur.	20.00
No. 2 foundry, Cleveland, del.	20.50 to 21.50
No. 2 foundry, del., Phila.	20.76 to 21.76
No. 2 foundry, N. J. tidewater	21.39 to 22.39
No. 2X, eastern del., Phila.	21.26 to 22.26
No. 2X, east. N. J. tidewater	21.89 to 22.89
No. 2X, eastern del., Boston	24.15 to 24.65
No. 2X, foundry, Buffalo fur.	19.00 to 20.00
No. 2X, Buffalo, del. Boston	24.41 to 24.91
No. 2 southern, Birmingham	19.00 to 20.00
No 2 southern, Cincinnati	23.05 to 24.05
No. 2 southern, Philadelphia	26.80 to 27.80
No. 2 southern, Chicago	25.01 to 26.01
No. 2 southern Cleveland	25.01 to 26.01
No. 2 southern, Boston (rail and water)	25.91 to 26.91
No. 2 southern, St. Louis	24.17 to 25.17
No. 2X, Virginia furnace	25.50
No. 2X, Virginia, Phila.	30.17
No. 2X, Virginia, Jersey City	31.04
No. 2X, Virginia, Boston	31.41
Gray forge, eastern Pa.	20.50 to 21.50
Gray forge, val. del., Pitts.	20.26 to 20.76
Low phos., standard, valley	28.00 to 29.00
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	24.00 to 24.50
†Low phos., English, Phila.	27.26 to 27.76
Charcoal, Birmingham	31.00 to 32.00
Charcoal, Superior Chicago	29.04

Silvery Iron
Jackson County, Ohio, furnace

7 to 8 per cent	29.00
8 to 9 per cent	30.50
9 to 10 per cent	32.50
10 to 11 per cent	34.50
11 to 12 per cent	37.00
12 per cent	39.50

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 to 11 per cent	39.50
11 to 12 per cent	42.00
12 to 13 per cent	44.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	107.00 to 107.50
Ferromanganese delivered Pittsburgh	111.79 to 112.29
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	35.00 to 38.00
†Spiegeleisen, English, delivered tidewater	35.00 to 38.00
Ferrosilicon, 50 per cent contract freight allowed	75.00
Ferrotungsten standard, cents per pound contained	88.00 to 93.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $3.75
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.00 to 3.25
Connellsville foundry	4.00 to 5.00
New river foundry	8.50 to 9.00
Wise county furnace	3.75 to 4.50
Wise county foundry	4.00 to 5.00
Alabama furnace	5.00 to 5.50
Alabama foundry	5.50 to 6.00

By-Product

Foundry, Newark, N. J., del.	$10.41
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.00
Foundry, St. Louis	12.00
Foundry, Granite City, Ill.	9.00 to 9.50
Foundry, Alabama	5.00 to 5.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$38.00
Open-hearth, Youngstown	38.00
Open-hearth, Philadelphia	43.17 to 45.17
Bessemer, Pittsbuprgh	38.00
Bessemer, Youngstown	38.00
Forging, Pittsburgh	43.00
Forging, Philadelphia	47.17 to 50.17

SHEET BARS

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00

SLABS

Pittsburgh	38.00
Youngstown	38.00

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$48.00

Standard extras, $2.50 per ton over @-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.15c to 2.25c
Universal skelp, Pittsburgh	2.15c to 2.25c
Sheared skelp, Pittsburgh	2.15c to 2.25c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.15c to 2.20c
Structural shapes, Phila.	2.32c to 2.57c
Structural shapes, New York	2.34c to 2.59c
Structural shapes, Chicago	2.35c
Structural shapes, Birmingham	2.30c to 2.35c
Tank plates, Pittsburgh	2.15c to 2.20c
Tank plates, Philadelphia	2.22c to 2.42c
Tank plates, New York	2.24c to 2.44c
Tank plates, Chicago	2.35c
Tank plates, Birmingham	2.30c to 2.35c
Bars, soft steel, Pittsburgh	2.15c to 2.20c
Bars for cold finishing, Pitts.	2.30c to 2.35c
Bars, soft steel, Philadelphia	2.52c to 2.62c
Bars, soft steel, New York	2.54c to 2.64c
Bars, soft steel, Chicago	2.25c
Bars, soft steel, Birmingham	2.30c to 2.35c
Bars, refined iron, Pittsburgh	3.00c to 4.75c
Bars, rail steel, Chicago	2.10c to 2.13c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.15c to 2.20c
Bar iron, common, Phila.	2.42c
Bar iron, common, New York	2.49c to 2.59c
Bar iron, common, Chicago	2.20c
Bars, forging quality, Pitts.	2.40c to 2.50c

Hoops, Bands, Strip

Prices per pound

Hoops, Ptitsburgh, under 5 in	2.60c to 2.75c
Hoops, Pittsburgh, 20 gage, under 1 in.	2.90c to 3.00c
Bands, Pittsburgh	2.60c to 2.75c
Hot rolled strip steel, Pittsburgh stamping quality	2.50c to 2.75c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	4.50c

Cold Finished Steel

Prices per pound

Cold finished steel bars, Pittsburgh base, carloads	2.90c
Cold-finished steel bars, base Pittsburgh, less carloads	3.00c to 3.25c
Steel shafting, Pittsburgh	2.90c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	25.00 to 28.00
Light rails, 25 to 45, mill	1.90c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.90c
Spikes, small railroad, Pitts.	3.25c to 3.40c
Spikes, boat and barge, Pitts.	3.40c
Spikes, railroad, Chicago	3.10c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Pitts., small	4.50c to 4.75c
Track bolts, Chicago	4.10c
Tie plates, Pittsburgh	2.50c to 2.55c
Ties plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	2.90c
Galv'd nails, 1-inch and over	5.15c
Plain wire, Pittsburgh	2.65c
Annealed wire, Pittsburgh	2.80c
Galvanized wire, No. 9 gage, Pittsburgh	3.25c
Barbed wire, painted, Pitts.	3.35c
Barbed wire galv., Pitts.	3.70c
Polished staples, Pittsburgh	3.35c
Galvanized staples, Pittsburgh	3.70c
Coated nails, count keg Pittsburgh	2.30c to 2.40c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.60c to 3.65c
No. 28, bessemer, Pitts.	3.60c to 3.65c
No. 28, open-hearth, Phila.	3.92c to 3.97c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	3.75c

GALVANIZED

No. 28, open-hearth, Pitts.	4.70c to 4.80c
No. 28, bessemer, Pittsburgh	4.70c to 4.80c
No. 28, open-hearth, Phila.	5.07c to 5.12c
No. 28, open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open hearth, Pitts.	2.75c to 2.80c
No. 10, bessemer, Pittsburgh	2.75c to 2.80c
No. 10, open-hearth, Phila.	3.02c to 3.12c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22, Pittsburgh	5.10c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3⅛ to 3¾-inch	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts	6.00c to 6.25c
Sheet piling base, Pittsburgh	2.20c to 2.25c
Cotton ties, bundle 45 lbs. Pittsburgh	$1.72
Cut nails, Pittsburgh	3.00c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$59.20
Six-inch and over, Chicago	55.20
Four-inch, Birmingham	52.00 to 53.00
Six-inch and over Birmingham	48.00 to 49.00
Four-inch, New York	65.60 to 66.60
Six-inch and over, New York	60.60 to 61.60

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Prices Are Steady

Market Seems To Have Reached Equilibrium—Better Buying Found But Dealers Will Not Sell Ahead

SCRAP PRICES, PAGE 1718

Chicago, June 24.—Iron and steel scrap sentiment is mixed, but slightly in favor of those expecting a higher market. The line of cleavage appears to be between brokers and yard interests, with the former inclining toward neutrality and the latter seeing improvement. While buying has not increased some sellers appear to be getting away from the short side, and yard stocks undeniably have been growing. A large user of malleable has placed some business at $16.50, delivered. Cast borings are more active owing to the efforts of sellers to fill a released order; this grade is probably 25 cents higher than the quotation of $10 to $10.50 but this strength is derived solely from this one order. Axle turnings, rerolling rails, grate bars and forge crops show some strength. Some dealers would mark heavy melting steel 25 cents above the spread of $13.50 to $14. Generally speaking, most sellers would hesitate to commit themselves at going quotations but actual transactions are insufficient to warrant an advance. Scrap offerings include 4850 tons by the Burlington railroad, 2350 tons by the Grand Trunk and 2000 by the St. Paul.

Boston Market Turns Upward

Boston, June 24.—Definite improvement in the iron and steel scrap situation has been apparent the past week. Prices have stiffened and in some cases slight advances are reported. Demand also has increased following inquiry early in the week from the Bethlehem Steel Corp. for borings and turnings. In some cases as high as $8.50 has been paid for cast iron borings for shipment to Pennsylvania. Heavy melting steel still hovers close to $10 but a sale of 200 tons is reported at $10.25 shipping point and several dealers are holding at $11. Following improvement in the steel scrap situation nearly all dealers have tightened on cast grades and while demand is still low No. 1 machinery is difficult to obtain at the low levels prevailing four or five days ago. Several cars of No. 1 machinery have sold at $20.50 and strictly textile castings have sold at $21. Rumors of lower prices still are heard, but no one disputes the firmer tone. Skeleton scrap, pipe, rails, and most other commodities are listless with prices unchanged.

New York Market Steady

New York, June 24.—The scrap market has lost some of bouyancy of a week or so ago. Prices in no case have declined, and on heavy melting steel and turnings there has been an advance of 50 cents a ton. The market has reached a point where dealers apparently do not find it as profitable to buy for storage and in view of continued dullness in consuming demand are content to mark time.

The strength in heavy melting steel appears to be based on continued contract buying for Coatesville, Pa., and Claymont, Del., dealers offering $15 and $15.50, delivered, respectively, for these points. On recently negotiated business for shipment to Pottsville, Pa., dealers have paid $15.50, delivered. Fresh consuming demand is a cause of the higher market on turnings. Cast scrap, wrought material and most other leading grades are showing little activity.

Dull in East

Philadelphia, June 24.—Demand for iron and steel scrap is dull and little activity is expected until after July 4. Prices generally are unchanged, though an easier tendency is manifested in some directions, due to a lack of business. A list by the Pennsylvania railroad offers 41,000 tons, compared with 45,000 tons last month. This includes the entire system. The Virginian railroad also has a list out.

Better Demand at Buffalo

Buffalo, June 24.—Better demand exists for iron and steel scrap than for several weeks. So far most inquiry is from consumers outside the Buffalo district but local consumers are showing increasing interest. The fact that outside buyers are seeking prompt shipment adds to the market's strength. Large consumers in Pittsburgh, Weirton and the East have been bidding for material held here. Offers average $16.50 for heavy melting steel, $15.50 for hydraulic compressed, $14.50 for cast iron borings and $14 for machine shop turnings. Buffalo dealers would pay an average freight of $3.50 on material sold at these prices. One local user is offering 50 cents under outside consumers on heavy melting steel but is not receiving any real tonnage, dealers say.

Pittsburgh Prices Stronger

Pittsburgh, June 24.—While undoubtedly the next sale of heavy melting steel will establish a higher price level, especially if it involves 15,000 or 20,000 tons, that market cannot now be quoted at other than $16.50. That is the figure consumers at Weirton, W. Va., and at Monessen, Pa., still are offering but since it also is the figure dealers are willing to pay for scrap to lay down in their yards, sales to the latter are the most prominent. Other grades are unchanged, iron car wheels holding to the recent advance of 50 cents per ton, now being quotable at $16.50 to $17. Relatively high prices were obtained by the Chesapeake & Ohio and the Norfolk & Western railroads on their recent lists, iron car wheels bringing about $18, delivered Pittsburgh, from a dealer. Nearby consumers of cupola cast are able to maintain only partial operations and are not purchasing heavily, hence the market cannot be quoted above $17.50 to $18. In fact, the restricted movement of all grades of scrap is more or less explained by curtailed operation of consumers, particularly among steel mills.

Light Sales at Detroit

Detroit, June 24.—Sales of scrap continue of small volume and there are few changes in price. Some deals between dealers have had a tendency to change quotations in open-hearth furnace grades, but the general market continues quiet with no inquiry from consumers.

Producers still have some supplies pressing on the market. It is believed that most auto plants will cease within 10 days in order to make ready for the bringing out of new models. Ship-

(*Concluded on Page* 1673)

Semifinished Buyers Wait

Carry-over to Third Quarter Is Large, and Users See Price Position Favoring Them—Some Effort Made To Develop Lower Quotations

SEMIFINISHED STEEL PRICES, PAGE 1663

Pittsburgh, June 24.—Efforts of steel sellers to stir up their customers to issue inquiries for sheet bars, billets or slabs are falling short of fulfillment. Many of them contracted for the second quarter on the basis of practically full operations. This has left much tonnage on the books yet to be taken out. For that reason conversion mills are more or less indifferent about their July, August and September needs. They know they can obtain deliveries easily and they feel sure that there is no immediate possibility of prices advancing.

While the general market on sheet bars is unchanged at $40, Pittsburgh, or Youngstown, the impression is growing that on attractive tonnages many mills would not hesitate long to go to $38. One West Virginia sheet bar maker is understood to be naming the $38 figure, but so far no sales are reported and the market on this product remains untested. One or two producers will quote $48 on wire rods only when large tonnages are under consideration. No inquiries are noted and while it is reported that $47 was named in the West, the $48 figure remains firm in this locality. Two or three third quarter contracts are about to be written up upon forging billets at $43, Pittsburgh. Skelp is inactive but is quotably unchanged at 2.15c to 2.25c, Pittsburgh.

Specifications Are Light

Youngstown, O., June 24.—While sheet mill schedules are on a higher basis this week no indication of the improvement is noticeable in the semifinished market. Consumers of sheet bars are specifying only in such quantities as are actually covered by sheet orders in hand, and the tonnage is small. One producer has his sheet bar mill idle pending the accumulation of specifications. A two-day rolling program is sufficient to fill all sheet bar business accumulated during a period of a week. The price of sheet bars remains unchanged at $40, Youngstown, although lack of inquiry leaves the market untested.

Price Feelers Put Out

Cleveland, June 24.—Some buyers of semifinished material have been sound-

ing the market in expectation of developing prices lower than $40 on sheet bars and $38 on billets and slabs, but makers generally are holding to these levels. Recent inquiries have been for 500-ton lots. Some small tonnages have been taken for special rolling. Sellers believe market prospects are brighter than in a number of weeks. Requests for prices have come recently from unexpected sources. The leading maker has not opened its books for the third quarter.

Eastern Sales Moderate

Philadelphia, June 24.—Billet sales total about 1000 tons, all for prompt delivery. The market price is $38, Pittsburgh, for rerollers and $43 for forging quality. Wire rods are held at $48 Pittsburgh. Sales are moderate.

Wire Holds Steady

Larger Buying of Mixed Carloads—Prices Are Unchanged

WIRE PRICES, PAGE 1663

Pittsburgh, June 24.—Any improvement in connection with wire rods is in connection with mixed carloads. A few more such were received the past week than in the week preceding. Jobbers are running short of certain wire products but the turnover is not as great as it should be because the farm season has gone beyond the time for erecting and repairing fences. Less price cutting is done, however, and the tendency apparently is more decided to hold 2.65c and 2.90c, base Pittsburgh, on wire and wire nails, respectively.

Prices Again Threatened

Chicago, June 24.—Quotations of 2.65c, Pittsburgh, on plain wire and 2.90c, Pittsburgh, on wire nails appear none too strong. In the past few days new business has been slightly greater but widely scattered and in comparatively small lots. Wire mill operations are still approximately 35 per cent.

Better Strip Demand

STRIP PRICES, PAGE 1663

Pittsburgh, June 24.—Enough improvement is noted by strip steel manufacturers to increase their operating schedules slightly to 48 or 50 per cent of capacity. A few releases are coming through from the automotive industry and other consumers. Hot strips for the most part are quoted at 2.60c, base Pittsburgh, although occasionally 2.50c is possible on large tonnages. On the other hand, some narrow hot strips still bring 2.75c. Cold strips are firm at 4.50c, except that on a fairly large tonnage of tubing steel bought recently a lower price was named and the order is understood to have gone at around 4.25c, base Pittsburgh.

Chicago Stack Banked

Chicago, June 24.—The banking of one more steelworks stack in this district has brought the number of active stacks of the two leading steel producers down to 13 out of a total of 30. Steel ingot operations are averaging from 45 to 50 per cent, compared with 50 per cent last week.

Coke Market More Active

Some Furnaces Inquiring for Third Quarter—Prices of $3 to $3.20 Still Apply on Prompt Lots—Foundries Renewing Contracts

COKE PRICES, PAGE 1663

Pittsburgh, June 24.—A few small blast furnaces are inquiring for third quarter supplies of beehive coke. One inquiry through brokers calls for 5000 tons monthly. The Jackson Iron & Steel Co., which bought by-product coke for June at $3.30, Fairmount, W. Va., having the same freight rate as from Connellsville, is negotiating for more of the same material from the same source for the third quarter. Prices of $3 to $3.20, Connellsville, still are in force on sales of one to five carloads at a time. The Western Electric Co., Chicago, bought 3000 tons of beehive standard furnace coke at $3.25, indicating the minimum quotation on extended deliveries. Medium sulphur coke is available around $3 to $3.15. High silicon coke is $2.75 and foundry cullings $2.85. Demand is quiet for all three grades. Several foundry coke contracts have been renewed for the third quarter, some extending over the last half, and all at $5. Premium brands bring around $6. Spot sales of foundry coke have been made at $4.25 to $4.75. Occasionally distress carloads are sold at $4.

Production of coke for the week ending June 14 was 75,530 tons, as compared with 82,690 tons the preceding week according to the *Connellsville Courier*.

Eastern Market Quiet

New York, June 24.—Trading in foundry coke continues quiet and is restricted to spot requirements. On standard beehive foundry coke for spot shipment the market continues $4.50 to $5, Connellsville. By-product foundry coke continues to be quoted at $10.41, delivered at Newark and other northern New Jersey points.

Seeks 18,000 Tons

Cincinnati, June 24.—The market here for beehive coke is extremely quiet. Sellers report prices are being shaded 25 and 50 cents a ton. The cancellation of shipments by furnaces going out of blast has depressed the market. Sellers express the belief that the suspension of additional ovens may counteract the weakening influences. The Jackson Iron & Steel Co., Jackson, O., is in the market for its third quarter coke requirements, which will aggregate 18,000 tons. Sales in the past week range from a carload to 200 tons. A leading seller reports the sale of five cars of New River foundry coke to a user in southern Indiana. By-product ovens have more coke to offer than for sometime.

Southern Prices Softer

Birmingham, Ala., June 24.—Coke production has not been reduced lately, and shipments have been maintained fairly well. There has been some weakening in quotations. Quotations are around $5.50 to $6 on the foundry grade. By-product coke oven plants are in steady operation. There is good demand for all the by-products. With the activity expected during the last half of the year, it is not improbable that 1924 will show a record coke production.

Sales in Small Lots

St. Louis, June 24.—Purchasing of coke is mainly in small lots for prompt shipment, but dealers and producers report some contracts by industrial users. The largest sale heard of was 8000 tons to an Iowa water gas manufacturer for delivery through the remainder of the year. Competition is keen and while quotably prices remain steady, concessions have been granted in a number of instances. The leading west side producer continues to quote $12, ovens, for foundry coke, and $9 to $9.50, f.o.b., Granite City, is asked by the St. Louis Coke & Iron Co.

Refractories Dull

Prices Recede in Some Grades as Consumers Buy Little

Pittsburgh, June 24.—Both fire clay and silica brick sellers have entered a quiet period. Here and there some blast furnace and open-hearth furnace operators are taking advantage of the dull period to make repairs and reline. These are specifying on their contracts and occasionally place new orders. New construction is limited and most furnace projects still are in the engineering stage. Most orders are for lots up to 50,000 or 100,000 brick for repairs or to supply the small general trade. Operations average 40 to 65 per cent of capacity. Prices have receded a trifle in fire clay, No. 1 Pennsylvania being quoted at $40 to $43 instead of $42 to $45. Ohio and Kentucky No. 1 grades also are down to a $40 minimum. Silica brick occasionally is available at $36 in Pennsylvania although the general market remains unchanged at $38. A fair amount of chrome brick is going forward on contracts at $45 and single carload sales in the spot market are bringing as much as $47.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$40.00 to 43.00
Pennsylvania, No. 2	33.00 to 37.00
Ohio, No. 1	40.00 to 43.00
Ohio, No. 2	35.00 to 38.00
Illinois, No. 1	45.00 to 48.00
Illinois, No. 2	42.00 to 44.00
Kentucky, No. 1	40.00 to 41.00
Kentucky, No. 2	35.00 to 37.00
Missouri, No. 1	38.00 to 40.00
Missouri, high grade	42.00 to 48.00
Maryland, No. 1	42.00 to 48.00
Maryland, No. 2	38.00 to 40.00

SILICA BRICK

Pennsylvania	$38.00
Chicago	47.00
Birmingham	48.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	$65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$45.00 to 47.00

Steel Bars Mark Time

Quotations Hold at Former Level and Some Revival of Demand Is Met, Though Consumers Show Little Interest

BAR PRICES, PAGE 1663

Chicago, June 24.—New business in soft steel bars has not increased perceptibly but sentiment appears to have turned the corner. Where two weeks ago consumers would not consider buying at any price they are now in a frame of mind where they would buy were they assured prices are going no lower. The radical reduction in production, which is still in process, has had a marked effect. There are no stocks of material, even ore receipts having been cut off sharply, and consumers are more and more considering building up to some degree their all-but-depleted stocks. Producers and consumers seem agreed the market is headed toward rcovery, though the gait may be slow. One producer of bars predicts deliveries will be considerably deferred 90 days hence. At this time prices are uncertain. Some buyers claim to have bought bars under 2.25c, Chicago, which is the open quotation of leading producers, but it does not appear that less than 2.25c is warranted.

One small mill making scrap bar iron is quoting 2.15c, Chicago, but other makers assert 2.20c is their minimum. One mill is shutting down for two weeks. Specifications are extremely light, which continues the case with rail steel bars. These are quoted 2.10c to 2.13c, Chicago.

New England Sales Slow

Boston, June 24.—Little change has taken place in bar sales during the past week. The leading producers holding firmly to 2.20c, base Pittsburgh, state they have not lost business because of price.

Demand Is Quiet

Philadelphia, June 24.—Steel bar demand is quiet. Prices are firm at 2.20c, Pittsburgh. Common iron bars now are 2.10c, base Pittsburgh.

Consumption Still Light

Pittsburgh, June 24.—Merchant steel bar consumers are not active in their own manufacturing enterprises and are not making heavy calls upon steel mills for tonnage. This is particularly noticeable among cold bar finishers whose requirements are curtailed by continued low operating rates in the automotive industry. Spring makers are not buying merchant steel bars. Specifications are light, new inquiries are scarce and negotiations for third quarter tonnages are almost absent. Market prices are unchanged at 2.15c to 2.20c, base Pittsburgh. Similar conditions exist in refined iron bars. Only an occasional small order is received, mostly from railroad car or locomotive builders. Open market quotations are 3.00c to 4.75c, base Pittsburgh.

Sentiment Shows Improvement

Cleveland, June 24.—Sentiment in the market has improved without bringing with it much of a betterment in orders for steel bars. The factor of price still appears to be the most important to buyers and when the latter appear in the market they make it a point to thoroughly feel out the situation on this side. New business still is confined to immediate requirements and represents only a very moderate tonnage. One lot of 1000 tons, however, was placed this week for stock, a large part of which was bars. Prices appear to be better withstanding any efforts to shade 2.20c, base, Pittsburgh. While there are reports that this figure has been and could be shaded on an especially attractive piece of business, it is apparent that such instances are exceptional.

Dull at Buffalo

Buffalo, June 24.—Demand for bars is light and inquiries and sales are in small tonnages. Prices are steady at 2.20c, Pittsburgh. Sellers anticipate no active demand until next quarter.

Cold Drawn Improvement Hazy

Pittsburgh, June 24.—Signs of improvement in cold-finished steel bars are not clearly defined. A few more orders are received but the total tonnage is small. One or two producers report improved specifications during the past week or 10 days. The price still is 2.90c, base Pittsburgh, with a 25-cent differential applying to less-than-carload quantities which in practically every case is being charged.

Hoops Not Encouraging

HOOP PRICES, PAGE 1663

Pittsburgh, June 24.—Encouraging signs are few in hoops and bands. Occasionally a small order is received but most users are not anticipating require ments and day-to-day needs are small. Prices are unchanged at 2.60c to 2.75c, base Pittsburgh, although some are now maintaining that maximum as their minimum. On narrow hoops and bands, 2.90c and even 3.00c, is procurable.

Nut, Bolt, Rivet Prices Holding Better

NUT AND BOLT PRICES, PAGE 1714

Pittsburgh, June 24.—Only small orders are noted in nuts, bolts and rivets. While various concessions in price still are being made, the tendency is to adhere more firmly to published discounts. On hot pressed square or hexagon blank or tapped bolts, a few contracts have been taken at $4.75 off list, but $5 off list still is quoted by some. Large machine bolts are quoted at 60 and 20 off, and large carriage bolts at 60 and 10 off. Most makers are disinclined to offer any additional price inducement. A similar condition is encountered in rivets. On structural rivets some makers have quoted as low at 2.50c, while others will not go below 2.65c in carloads and 2.75c in less-than-carload lots. The regular discount on small rivets is 70 and 10 off although occasionally an extra 10 per cent is granted.

Booking Third Quarter Contracts

Philadelphia, June 24.—Third quarter contracts now are being booked for bolts, nuts and rivets. In some cases, makers are simply extending second quarter contracts through the third quarter on the present price basis. On large machine bolts, 60 and 10 off is the usual figure. Small rivets are going at 70 and 10 off, but some contracts are being placed at 75 off. Large rivets range from 2.60c to 2.90c, Pittsburgh.

Not Backing Third Quarter

Cleveland, June 24.—Bolt and nut makers here have not yet named prices for third quarter and consequently no business for that delivery is being taken. Spot orders are reported slightly heavier but the volume of business being receivd is far from satisfactory.

Th leading rivet maker here has announced 2.60c base on large rivets and 70, 10 and 5 off on small rivets as its third quarter price. Rivet demand is extremely dull and the immediate outlook is not promising, inquiries being small and few.

Prefer Not To Contract

Chicago, June 24.—One maker of bolts and nuts is contracting for third quarter on the basis of 60 and 20 off for large machine bolts but prefers not to bind itself because it believes a higher price will govern toward the end of the quarter. Keen competition for the small current business has brought the large machine bolt quotation as low as 70 off. Demand is no heavier but among makers there is a feeling that a turn is near.

Downward Revision Made in Warehouse Prices

WAREHOUSE PRICES, PAGE 1710

New York, June 24.—Prices on shapes, plates and steel bars have declined about $3 a ton in the local warehouse market. Bars now are being quoted generally at 3.34c, and shapes and plates at 3.44c. These prices are predicted on a mill base of 2.25c, Pittsburgh, for bars and 2.35c, Pittsburgh, for shapes and plates. While this differential does not prevail at the mills at present, jobbers regard this as the normal differential, which they believe will again become operative in the relatively near future. Jobbers also assert that the mills in many instances are booking small lots at substantially these figures. While the remainder of the list is unchanged, some warehouses look for a reduction in cold-finished products. Black and galvanized sheets, as noted in a recent issue, were reduced approximately $2 about 10 days ago. Buying still continues at a slightly higher rate than prevailed in May.

Demands Continues Steady

Boston, June 24.—Following the action of one of the leading interests, iron and steel warehouses in this district have reduced their prices on bars to 3.365c, shapes and plates to 3.465c and black sheets to 4.85c. Demand continues steady.

Drop $3 a Ton

Pittsburgh, June 24.—Effective Saturday, June 21, Pittsburgh warehouses reduced prices on steel products $3 per ton. This makes the steel bar price 3.00c, base Pittsburgh. Other prices follow: Steel plates and shapes, 3.10c; sheared

plates, 3/16-inch, 3.35c; hoops and bands, 3.70c; cold-finished steel bars (rounds) 3.90c, (squares, hexagons and flats) 4.40c; common nails, 3.30c; cement coated nails, 2.90c; smooth, foundry, and large head roofing nails, 3.40c; black and galvanized wire, 3.20c. These changes conform more or less to recent adjustments made in mill prices to meet competitive market conditions.

Firmer Tone Is Noted

Philadelphia, June 24.—A firmer tone is noted here in warehouse prices, with some of the recent minimum figures having disappeared. The market generally is somewhat higher, although the volume of business is small.

Prices Drop $2 to $5 a Ton

Buffalo, N. Y., June 24.—Warehouses in this district have announced a reduction of $3 a ton on bars, plates, bands, $5 on sheets and $2 on cold-finished shapes and rounds.

Bars, Plates and Shapes Cut $3

Cleveland, June 24.—General revision downward of prices was made by many iron and steel warehouses during the past week. The most prevalent cut was that in bars, plates and shapes, of $3 a ton. Hoops and bands are down $4 per ton. Bars now are quoted at 3.21c, while plates and shapes are listed at 3.31c, Cleveland. No further reductions of sheets or cold-finished prices were put into effect, local interests having anticipated the cut in the latter products several weeks ago. The volume of business is about on a par with that of the past few weeks, although several dealers claim a slight increase in both inquiries and sales.

Few Grades Left Unchanged

Detroit, June 24.—General revision of prices has been made by iron and steel warehouses here. The new price list represents a reduction of approximately $2 a ton. Only chain and carbon tool grades of steel were left unchanged. Dealers report improvement in trading in recent weeks. Inquiries are the largest in 60 days. Light structural shapes and bars continue to meet the largest demand. Stocks are large.

Two Iron Ore Bridges Destroyed by Storm

Cleveland, June 24.—A severe windstorm on the night of June 20 destroyed two ore storage bridges and damaged a third at Lake Erie docks. At Conneaut one of the bridges of the Pittsburgh & Conneaut Dock Co., subsidiary of the United States Steel Corp., was destroyed. The other bridge at this company's dock was not damaged, and the facilities are ample for handling ore. The National Tube Co.'s bridge at the Lorain, O., plant was thrown off its track and damaged, but will be in operation again in a few weeks. There are two other ore bridges at this point.

The ore unloading bridge of the Ashtabula & Buffalo Dock Co., at Ashtabula, O., also was destroyed. This company is identified with Pickands, Mather & Co. There is another bridge at Ashtabula operated by the Pittsburgh, Youngstown & Ashtabula Railroad Co. The bridges are used for storing ore. Much of the ore received is loaded for direct shipment. Several months will be required to rebuild the bridges that were destroyed.

Plate Business Picks Up

More Tank and Locomotive Awards Feature Market—Several Lake Boats Being Negotiated—Little Change in Prices

PLATE PRICES, PAGE 1663

Philadelphia, June 24.—Plate mills are more active because of somewhat larger bookings, also in anticipation of the shutdown next week. Pending inquiries for locomotives involve 4000 to 4500 tons of plates. The Pennsylvania railroad has inquired for a third less tonnage than usual, requiring 200 to 500 tons each of plates, shapes and bars. Current business is mainly in large orders for prompt shipment; there is no third quarter contracting. General business is bringing 1.90c to 2.00c, Pittsburgh, for attractive orders, and 2.10c for small lots.

Good Tonnages Placed

New York, June 24.—The Chicago Bridge & Iron Works has booked two 55,000-barrel and two 10,000-barrel tanks for the Baltimore Terminal Co., involving 750 tons of plates. The same fabricator has booked twenty 80,000-barrel tanks for the Marland Refining Co., involving approximately 6000 tons of plates. The Bethlehem Steel Co. has booked 2400 tons of steel for six ferry boats for the city of New Jersey, of which three will be built by the Staten Island Shipbuilding Co., and three at the Tebo yard of the Todd Shipyards Corp. Connery & Co., Philadelphia, have booked an order for a stack to be erected for the Public Service Corp. of New Jersey. This stack involves about 400 tons of plates. The Standard Oil Co. of New Jersey has placed several hundred tons of plates, both tank and fire box quality, during the past week, for delivery at various points. The New York Central railroad is in the market for its third-quarter plate requirements. The Lehigh Valley railroad also is taking prices on its third-quarter requirements. Some good plate tonnage has been placed by fabricators during the past week. There also has been some plate business from jobbers. The market is unchanged, excepting that 1.90c, Pittsburgh, has become more common on attractive tonnages and some business has been placed at a considerable concession from that figure. Some less than carload business has been placed during the past week at 2.00c, Pittsburgh.

Requirements Easily Filled

Pittsburgh, June 24.—Plate requirements for the most part remain small and are easily filled by the mills. Some of the plate mills are operating 70 per cent of capacity, while others are not doing so well. Little oil storage tankage is up for consideration, although a few tanks still are to be bought by two or three oil companies. The Pittsburgh-Des Moines Steel Co. was awarded a stand pipe at Miami, Fla., involving about 700 tons, mostly plates. The American Bridge Co., was the low bidder on two scows for the United States engineers, Pittsburgh district, on its bid of $18,250 each. These involve approximately 250 tons of plates. Authorization for placing the order probably will be received from Washington within a week or two. The Carnegie Steel Co., it is understood, will not furnish the plates to be fabricated by the Riter-Conley Co., for the eight 84,000-barrel tanks to be erected at Baton Rouge, La., for the Standard Oil Co. of Louisiana. The plates, approximately 3500 tons, are to be furnished by the Standard Oil Co. to the Riter-Conley Co. Plates are quotable the same as last week, 2.15c to 2.20c, Pittsburgh. Large tonnage orders can be placed at the lower figure, while ordinary lots bring 2.20c.

Boat Orders in Sight

Cleveland, June 24.—Some of the ship operators on the lakes are beginning to show interest in the ordering of new boats for next spring delivery and this has resulted in revival of negotiations with lake shipbuilders. Recent reference has been made to one ore freighter being considered but it is understood that several vessels now are being considered. The plate market continues to show a little more breadth and additional buyers in the manufacturing field have placed orders in stock sizes during the past week. Demands from the oil industry continue to appear. A Standard Oil inquiry for 3000 tons for tanks is out from Buffalo. Another matter involves 2000 tons of plates and shapes. One lot pending involves 125 tons. The McKinney Steel Co. recently was a buyer of 200 to 300 tons for blast furnace improvement. From 1000 to 1500 tons of plates is involved in a new locomotive inquiry for the Seaboard Air Line being figured in this territory. Plate prices are not firm at 2.20c, the general open figure which the larger producers are naming. Shading of this price by $1 to $2 a ton is being done by some mills where the business is especially desirable.

Figuring Oil Tanks

Chicago, June 24.—Local tank makers have before them oil storage tank business aggregating 20,000 to 25,000 tons of plates. For some time plates have been weak and in light demand, and rumors of price weakness have been most insistent in the matter of plates. Claims of doing less than 2.35c, Chicago, are frequent, but the mills assert they are stabilizing at that level.

Local mills will furnish 3000 to 3500 tons of steel for a car ferry recently awarded to shipyards by the Ann Arbor railroad.

Decline Seems Checked

Pittsburgh, June 24.—The decline in operating schedules apparently has been checked for the time being, average operations being practically on the same basis as a week ago. Steelmaking is slightly in advance of 40 per cent as a general average. The Carnegie Steel Co. is operating 45 per cent of its ingotmaking capacity. It still has 27 out of 59 blast furnaces active although it may find it necessary soon to blow out two more.

Concrete Market Stronger

Better Business Sentiment Reflected in Reinforcing Bars—Most Sales Small but Aggregate Good—Chicago Sewer Takes 1700 Tons

REINFORCING BAR PRICES, PAGE 1663

Chicago, June 24.—Concrete reinforcing bar interests continue to devote their major efforts to closing jobs that have been pending for some time, as new work steadily is becoming slower in developing. Competition for current work is keen and buyers are exerting every effort to hammer the price down. The average for large and medium-size jobs probably is 2.40c, Chicago, but a spread of 2.35c to 2.45c, Chicago, now is more indicative of today's market.

Small Tonnage Moves Best

Buffalo, N. Y., June 24.—Except for small and medium sized lots wanted by road builders there is small inquiry for reinforcing bars. These lots range from 20 to 125 tons. Prices have been steady and well maintained although little new business has come to sellers within the past two weeks. There is little inquiry from building contractors.

Much Road Work Ordered

Pittsburgh, June 24.—Considerable road work was contracted for in the last few weeks taking a large aggregate tonnage of reinforcing concrete bars. The Concrete Steel Co. again has taken orders involving about 200 tons, and is working on two or three additional lots for road work in the Denora and Indiana, Pa. sections. Numerous inquiries are out for industrial buildings, each involving up to 50 tons. The 500-ton lot to be used in building the Clark's Ferry, Pa. bridge near Harrisburg, Pa., has been ordered by the Vang Construction Co., general contractor, from the Columbia Rolling Mill Co., Columbia, Pa. Warehouse interests here usually quote 2.40c although some recently have gone to 2.30c Pittsburgh. Mill prices are unchanged at 2.15c to 2.20c Pittsburgh.

More Tonnage Being Placed

Cleveland, June 24.—More tonnage of reinforcing concrete bars is being moved, although most awards still call for small lots. Truscon Steel Co. will furnish about 400 tons for road work booked in the past few weeks, consisting of many projects taking from 5 to 30 tons each. Inquiry is heavier but sales are not gaining proportionately. Prices continue weak, with 2.20c on new billet bars being shaded for attractive tonnages. Rail steel prices continue 2.00c to 2.10c, with few large tonnages placed. Bars out of stock are weak at 2.55c to 2.65c, Pittsburgh, some interests basing quotations on 2.40c, Pittsburgh.

Small Tonnages Moving

Cincinnati, June 24.—Relatively unimportant tonnages are involved in concrete bar transactions closed last week. The Ferro Concrete Construction Co., has been awarded the general contract for the Broadway apartments, Columbus, O., which will require 150 tons. The construction company is in the market for 400 tons of bars. New billet bar prices range from 2.15c to 2.20c, Pittsburgh.

CONCRETE CONTRACTS PLACED

Awards this week	6,655 tons
Awards last week	3,720 tons
Awards two weeks ago	2,455 tons

1800 tons, north side sewer for Sanitary District of Chicago, Chicago, to the Concrete Steel Co.
1200 tons, building for General Electric Co., Philadelphia, to Pittsburgh Crucible Steel Co.
600 tons, elevated extension for Chicago, North Shore & Northern railroad, Chicago, to the Kalman Steel Co.
530 tons, building for Victor Talking Machine Co., New York, to Concrete Steel Co.
500 tons, the Clark's Ferry, Pa., bridge near Harrisburg, Pa., ordered by the Vang Construction Co., general contractor, from the Columbia Rolling Mill Co.
400 tons, many small roadwork projects, in Ohio and Pennsylvania, to Truscon Steel Co.
375 tons, American Can Co. building, San Francisco, to Edward L. Soule Co.
300 tons, Wardman garage, Washington, to Concrete Steel Co.
275 tons, office building, Nineteenth and Broadway, Oakland, Cal., to Edward L. Soule Co.
200 tons, Pennsylvania state road work, to the Concete Steel Co.
175 tons, office building, First and San Carlos streets, San Jose, Cal., to Edward L. Soule Co.
100 tons, garage, Jackson and Mint streets, San Francisco, to Edward L. Soule Co.
100 tons, United Holding Co., Seventh and Julia streets, San Francisco, to Badt-Falk Co.
100 tons, Lorain hotel, Toledo, O., to Bourne-Fuller Co.

CONCRETE CONTRACTS PENDING

2000 tons, first unit, Broad street subway, Philadelphia; bids being taken.
2000 tons, approach for Delaware River bridge; bids to be taken shortly.
1100 tons, section of North Side sewer for sanitary district of Chicago; contractors' bids in.
500 tons, highway bridge at Norristown, Pa.; bids open July 1.
500 tons, anchorage for Delaware River bridge, Philadelphia, pending.
450 tons, bridge at Phoenixville, Pa.; general contractor, Hoover-Ryan Construction Co.
250 tons, telephone building, Canton, O.; bids in.
230 tons, Pennsylvania railroad bridge at Sunbury, Pa.; Whiting Turner Construction Co., Baltimore, awarded general contract.
200 tons, Penn Athletic club, Philadelphia; bids open July 8.
200 tons, building for Hardwick & Magee Co., Philadelphia; the Ballinger Co., that city, architect.
150 tons, Broadway apartments, Columbus, O.; Ferro Concrete Construction Co., Cincinnati, awarded general contract.
150 tons, building for the Citizen's Title & Trust Co., Uniontown, Pa.; general contract awarded the Mellon-Stuart Co., Pittsburgh.
105 tons, bridge over San Luis Rey river, San Diego, Cal.; bids in July 7.
100 tons, telephone building, Akron, O.; plans expected soon.
100 tons, grandstands for Wisconsin state fair grounds at Milwaukee, in addition to 100 reported as awarded last week; bids in.
Tonnage unstated, stadium for University of Dayton, Dayton, O.; pending.

Imports More Varied

Philadelphia, June 24.—Imports of iron and steel and ores into this port for the week ended June 21 were more varied than in preceding weeks and consisted of the following: Billets, from Sweden, 8 tons; shapes, from Belgium, 59 tons; manganese, from British West Africa, 4491 tons; chrome ore, from Portuguese Africa, 2000 tons; scrap steel, from England, 25 tons; pig iron, from France, 1001 tons, from England, 500 tons; iron ore, from Germany, 586 tons, from Egypt, 900 tons, from British India, 2550 tons, from Algeria, 6000 tons; cast iron pipe from France, 116 tons.

Pipe Orders

Good In Aggregate—Boiler Tubes Sharply Cut—Cast Buying Better

PIPE PRICES, PAGE 1663 AND 1714

Pittsburgh, June 24.—Miscellaneous pipe business continues good in the aggregate although individual orders are small. Notwithstanding dwindling operations in various oil fields of the South and West, oil country jobbers occasionally have to order pipe, and this demand, coupled with a more or less similar rate of buying among jobbers of standard full weight merchant pipe, enables the mills to avoid lowering operating schedules further. The present average is 65 or 70 per cent of capacity. While a few jobbers of standard full weight merchant pipe still are offering comparatively low figures to liquidate their stocks, mills show no signs of revising their quotations downward and still are quoting the April 19, 1923, card rates.

In connection with boiler tubes, not enough business is current to go around and to satisfy the producers, consequently keen rivalry exists and each order stands by itself in the matter of quotations. The regular market price therefore, is practically lost to sight since as many as three extra discounts of 5 per cent each have been added on top of the regular discounts.

Inquiries Are Stronger

New York, June 24.—Buying of cast iron pipe still is confined almost entirely to private work and although there is not as much as there was a month ago, some fair-sized inquiries have come out recently. Municipal demand is showing little life, and with the possible exception of some contemplated work for New York, few sizable tonnages are in prospect. Prices are unchanged, deriving most of their strength from the fact that the shops are booked six to eight weeks ahead. There have been few tonnages of sufficient size lately to afford the market a real test.

Small Business Aggregate Fair

Chicago, June 24.—Makers of cast iron pipe have no especially large business before them but the aggregate of small business is fair. Fall buying is not yet under way and municipalities, like commercial users, are loath to buy more than their absolute requirements. Price weakness continues in the larger sizes and makers of these sizes are keen for business. The most general quotations still are $59.20, Chicago, for 4-inch pipe and $55.20, Chicago, for 6-inch and over.

Production Is Steady

Birmingham, Ala., June 23.—Production of cast iron pipe in the South still is steady although the trade is receding. Lettings are not as plentiful as recently and unless there is some increased buying by those municipalities

and corporations planning to use pipe, the prospects are not bright for operations after the last of August. No pipe is on the yards here and shipments are equal to production. Quotations are about the same as for the past few months though now and then concessions appear.

CAST IRON PIPE PLACED

100 tons, Ford City, Pa., to James B. Clow & Sons.
100 tons, Ypsilanti, Mich., to James B. Clow & Sons.
100 tons, Kalamazoo, Mich., to James B. Clow & Sons.

CAST IRON PIPE PENDING

8568 tons, 4 to 24-inch pipe for Los Angeles; bids in.
410 tons, Detroit City Gas Co., Detroit; pending.

Tin Plate Demand

Still Unsatisfactory — Further Decline in Operations Expected

TIN PLATE PRICES, PAGE 1663

Pittsburgh, June 24.—Unless demand for tin plate improves mills cannot continue to operate at 65 or 70 per cent of capacity. In July there will be the usual shutdowns for vacations and mill repairs, and the average for that month will probably be under 50 per cent. The thing that held up operations so remarkably well in March and April when around 90 per cent was the general average, as against 70 per cent at present, was the sustained activity in general line cans. All consuming lines in that classification, with the possible exception of paint and varnish containers, were about normal. Concerning the three large vegetable packs, it is too early to obtain any definite forecast regarding corn and tomatoes, and the reports concerning the late pea crop are meager. Most of the fruit packs promise to be normal. Preparations have been made for most if not all of these, and specifications are in hand or are being received from large can makers for the tin plate material. No new inquiries are appearing to test the market, which is generally quoted at $5.50 per base box of 100 pounds, Pittsburgh, except where preferential prices are made on account of the large annual tonnage consumption of the particular buyer negotiating. The H. J. Heinz Co. has not as yet closed on its inquiry, out for two or more weeks, and the Standard Oil Co. of New York is understood to be closing up its 150,000 base box order with English makers.

Japanese Company Makes Purchase

New York, June 24.—The Kioto Oil Co., Japan, has placed an order for over 13,000 boxes of tin plate with the United States Steel Products Co.

Can Makers Specifying

Youngstown, O., June 24.—Tin plate production in this district is being supported at about 42 per cent of capacity, by past bookings and new business. While can makers are specifying, the tonnage involved is not in line with the usual volume placed during this time of the year. Production plate is being quoted at $5.50 per base box, Pittsburgh, and plate from stock $5 to $5.25. No effort has been made by producers to build up stocks.

Sheet Market Is Brighter

More Tonnage Released, Jobbers Begin To Replace Stocks, and Price Range Narrows—Sentiment Among Valley Makers More Hopeful

SHEET PRICES, PAGE 1663

Pittsburgh, June 24.—Orders from jobbers for sheets to replace depleted or uneven stocks are in the lead. Several were received early this week involving an attractive tonnage. This indicates that many consumers ordinarily ordering a carload or more direct from the mills are buying smaller lots from jobbers. To this extent the sheet market shows improvement, although the orders are not heavy as yet, and are far from what they should be at this time of the year. Operations in one or two cases are slightly improved. The American Sheet & Tin Plate Co. advanced its average 4 or 5 per cent since a week ago. It now has seven of the eight sheet mills at its Farrell, Pa., plant working full. The four additional mills under construction there will possibly be built by Aug. 15, or a month ahead of schedule. The general average operation for the industry in this vicinity is between 45 and 50 per cent. Some blue annealed, black and galvanized sheets for various uses are being ordered in small lots and occasionally a small order comes through for full-finished automobile sheets. In large part, however, improvement in automotive sheet consumption has not as yet reached the mills, although should it continue the mills will feel it within a week or two. The Fisher Body Corp., large consumer of full-finished sheet material, is advertising for all of its men laid off in recent weeks to come back to work on full time. This and one or two other signs of improving conditions are noted in that industry. In the matter of price, the market is more clarified than it has been in weeks past. The majority of makers, including the American Sheet & Tin Plate Co., now are quoting 2.80c, 3.65c and 4.80c, Pittsburgh, on blue annealed, black and galvanized sheets, respectively. Since one or two independent makers are quoting levels $1 or $2 per ton under those prices, they are considered the top of the market. A West Virginia sheet producer recently advanced its quotations so that instead of being $2 or $3 under those levels, it now is $1 or $2 below. It with others is quoting 3.60c on black and 4.70c on galvanized. Blue annealed can be had at 2.75c. Full-finished automobile sheets are held at 5.10c Pittsburgh, by all producers.

Releasing More Tonnage

Youngstown, O., June 24.—While the sheet market has not experienced any large volume of new business, those in close touch with the situation believe the corner has been turned. A better feeling prevails in this district. Four weeks ago the rate of operations began to recede. Last week only 15 per cent of the sheet mills here were scheduled, the lowest rate in over three years, but this week schedules increased to 41 per cent of capacity. This recovery is attributed to accumulation of tonnage; but buying interest is being revived. Releases of tonnages were rather general during the week, and in one case the consumer released all tonnage now on record for delivery this quarter. Spot material is moving in fair tonnages but takers continue to emphasize immediate delivery. Competitors' prices in outlying districts still mirror concessions of $1 a ton on black but the softness is becoming less pronounced. Manufacturers here are adhering to quotations of 3.65c on black, 2.80c on blue annealed and 4.80c on galvanized, Pittsburgh. An inquiry for 1250 tons of stove stock is pending.

Sales Made to Coal Interests

Philadelphia, June 24.—Practically the entire anthracite trade has placed orders for third quarter sheets. Otherwise, most consumers are not contracting. Sheet tonnage has increased somewhat. Operations of eastern mills range from 50 to 75 per cent. Blue annealed is 2.75c to 2.80c, Pittsburgh. Occasionally 2.70c is done. Black sheets are 3.60c to 3.65c. Galvanized is generally 4.75c to 4.80c. Some lots have been placed at 4.70c.

Competition Is Sharper

Chicago, June 24.—Weather conditions continue favorable to unusually high operations of sheet mills for late June, and consequently the need for new business is more acute. The placement of some business has been attended by sharper competition than has prevailed for several weeks and the quotations of 4.80c, Pittsburgh, on galvanized sheets, 3.65c, Pittsburgh, on black sheets and 2.80c, Pittsburgh, on blue annealed sheets are none too strong.

Ore Consumption Drops 1,000,000 Tons in Month

ORE PRICES, PAGE 1714

Cleveland, June 24.—Consumption of Lake Superior iron ore in May declined more than 1,000,000 tons from the tonnage used in April, the Lake Superior Iron Ore association reports. The amount of ore on dock and at lower lake furnaces June 1 was nearly 3,000,000 tons more than on that date last year. The figures in detail, reflecting the decrease in demand and slowing up in the ore trade, are as follows:

	Total
Ore consumed in April	4,881,855
Ore consumed in May	3,830,457
Decrease in May	1,051,398
Ore consumed in May 1923	6,118,540
Ore on hand at furnaces June 1, 1924	16,716,673
Ore on Lake Erie docks June 1, 1924	4,890,946
Total at furnaces and Lake Erie docks June 1, 1924	21,607,619
Total June 1, 1923	18,864,791

Charles Shongood has been appointed custodian of Knoeppel, Johnston & Hastings, Inc., industrial engineers, New York, as a result of the recent petition in bankruptcy.

ShapeDemandMaintained

Steady Award of Numerous Projects Placing Fabricators and Mills in Better Condition—New York Awards Over 20,000 Tons

STRUCTURAL SHAPE PRICES, PAGE 1663

New York, June 24.—Structural steel buying in the metropolitan district is considerably improved, with large orders aggregating more than 20,000 tons having been closed in the last week. Featuring this increased buying is the award of 7500 tons for the municipal market house in Brooklyn, which went to Hay Foundry & Iron Works, and 5000 tons for Tishman buildings to Levering & Garrigues Co. The largest new work involved 10,000 tons for the Rickard office building an stadium, on which bids are to be asked in six or eight weeks. Virtually all of the leading fabricators in this district are operating at a good rate, with the largest running around 80 per cent.

One drawback although reflecting certain aspects of strength is the large volume of work on fabricator's books, held up for shipment, pending completion of preliminary construction work. One large shop has a greater accumulation of this tonnage than at any other time in its history. Several factors enter into this situation but possibly the largest has been the tendency among builders to close on steel in an effort to take advantage of going prices before plans are fully completed and under way.

The market on plain shapes continues to hold around 2.10c to 2.20c, Pittsburgh, on the general run of business; fabricated material prices are holding fairly steady. Excepting electrical equipment, steel relatively, is the cheapest item on the list of building supplies. Locally, the ironworkers' strike continues to retard business. Fabricators report a steady gain in operations, although the increase has not been as great as most of these interests expected at the beginning of the strike.

The injunction hearing brought by the Iron League, has been postponed until July 7.

Many Jobs in Sight

Boston, June 24.—Structural steel fabricators report an increase in the number of small jobs now being figured. Prospective work includes several round tonnage projects. Last week awards of jobs running under 100 tons were the largest in two months. Small builders are commencing to feel that this is the proper time to start construction and steel companies find inquiry for small lots much improved. Prices are weak with tendency to go below 2.00c, base Pittsburgh, although the leading sellers hold firm to 2.15c and report a fair amount of business at this level. At least two of the small eastern mills are quoting 2.00c, Pittsburgh, and there are rumors that this figure has been shaded. Plates are soft with recent business placed at 1.90c, Pittsburgh.

Inquiries Plentiful; Orders Few

Pittsburgh, June 24.—Structural shape inquiries are plentiful but it requires many orders to aggregate a satisfactory tonnage. The Pittsburgh-Des Moines Steel Co. received a number of small orders in and around Pittsburgh last week, the total being only 150 tons. The Fort Pitt Bridge Works received the award of the power house for the Columbia Power Co., Union Gas & Electric Co., Cincinnati, taking 3700 tons. Fabricators in this vicinity are operating only 40 to 60 per cent of capacity, although one or two are at 70 to 80 per cent. Within 30 or 60 days bids will be advertised for on the replacement of the Sixth, Seventh and Ninth street bridges, Pittsburgh, which will require several thousand tons of steel. Structural shape prices are unchanged from a week ago, 2.15c, Pittsburgh being possible on tonnage orders whereas on the usual run of small orders 2.20c applies.

Operations 40 to 60 Per Cent

Philadelphia, June 24.—Shape mills are operating from 40 to 60 per cent of capacity with bookings about equal to shipments. Structural projects are becoming larger. Prices are unchanged at 2.32c to 2.52c, Philadelphia, equivalent to 2.00c to 2.20c, Pittsburgh.

Market Much More Active

Cleveland, June 24.—The structural market has recovered sharply from the lull of the last few weeks, and although most of the pending projects still are sub rosa, a more cheerful tone is evident. A tendency on the part of buyers to close more quickly is noticed, the low prices evidently bringing interests into the market that otherwise would postpone action. Among the work being figured are 1000 tons for repairs to ore bridges recently damaged in this district, a project taking several thousand tons of shapes and plates, and 200 tons for Sandusky Cement Co. Prices are strengthened somewhat by better sentiment although the low quotations of the last few weeks have not disappeared from the market, and 2.25c, Pittsburgh, on plain shapes is the going price.

Business Again Tapering Off

Chicago, June 24.—After a spurt of several weeks structural activity is somewhat lower but this is to be expected in view of the fact it is almost too late now to place steel for large structures and have them enclosed before winter. Two large projects in Chicago, the 4000-ton Illinois Athletic Women's club and the 7000-ton Lake Shore Athletic club, are nearer going ahead than they have been. Claims are made by local fabricators that they can break under 2.35c, Chicago, on plain material on attractive specifications but local mills claim the general quotation still is 2.35c.

STRUCTURAL CONTRACTS PLACED

Building awards this week..... 34,144 tons
Building awards last week ..... 16,879 tons
Building awards two weeks ago.... 26,658 tons

7500 tons, municipal building, Brooklyn, N. Y., to Hay Foundry & Iron Works.

5000 tons, Tishman buildings, New York, to Levering & Garrigues Co. One is a loft on Thirty-fourth street, taking 4000 tons and the other an office at Forty-third street and Lexington avenue, taking 1000 tons.

3700 tons, power station for the Columbia Power Co., Union Gas & Electric Co., Cincinnati, O., to the Fort Pitt Bridge Works.

2400 tons, Golding apartments, Riverside drive and 111th street, New York, reported awarded last week, to Harris Structural Steel Co.

1800 tons, office for Bethlehem Engineering Corp., 1560 Broadway, New York, to Levering & Garrigues Co.

1800 tons, power house at Des Moines, Ia., for the Illinois Power & Light Corp. to the Des Moines Bridge & Iron Co.

1600 tons, anchorage for the Delaware river bridge, Philadelphia, to American Bridge Co.

1200 tons, state hospital, Secaucus, N. J., to Fagan Iron Works.

1000 tons, school No. 73, New York, to the McClintic-Marshall Co.; the Carleton Construction Co., 7151 West Forty-second street, New York, is general contractor.

900 tons, bridge at Glendive, Mont., to the Minneapolis Steel & Machinery Co.

800 tons, Keith theater, Boston, 400 tons to American Bridge Co. and 400 tons to New England Structural Co.

750 tons, Albany bridge, Oreg., to Union Bridge Co.

750 tons, high school at Denver, to Burkhardt & Sons.

700 tons, plates, stand pipe for Miami, Fla., to the Pittsburgh-Des Moines Steel Co.

700 tons, sub-station, for the Public Service Corp., Kearny, N. J., to the Shoemaker Bridge Co.

650 tons, apartment at West End avenue, New York, to Taylor-Fichter Steel Construction Co.

500 tons, store building, Silverman Bros., Altoona, Pa., to the McClintic-Marshall Co.

500 tons, school No. 19, New York, to A. E. Norton, Inc.; the Carleton Construction Co., 1151 West Forty-second street, New York, is general contractor.

400 tons, Commercial Club building, San Jose, Cal., to Moore Dry Dock Co., previously reported awarded Schrader Iron Works.

350 tons, stock building for the Edison Electric Illuminating Co., Boston, to Levering & Garrigues.

350 tons, Chesapeake & Ohio bridge at Clifton Forge, N. Y., to unnamed fabricator.

300 tons, factory building for Schiffenhaus Bros., Newark, N. J., to unnamed fabricator.

300 tons, office building for Cole-Brant, Canton, O.; reported awarded unnamed fabricator.

300 tons, plant building for C. O. Bartlett & Snow Co., Cleveland, to be fabricated by the Bartlett & Snow company and Bethlehem Steel Co.

250 tons, buck stays for the blast furnace of the McKinney Steel Co., Cleveland, to the American Bridge Co.

235 tons, Pioneer Trust & Savings Bank building, Chicago, to Morava Construction Co.

225 tons, hotel at Corry, Pa.; reported awarded to unnamed fabricator. Chapman & Graham, Johnstown, Pa., general contractors.

225 tons, apartment, Albany, N. Y., to Syracuse Steel Co.

200 tons, textile mill, Fort Worth, Tex., to the Ft. Worth Steel Co.

200 tons, building for congregation of Beth Israel, 347 West Thirty-fourth street, New York, to Hinkle Iron Co.

200 tons, powerhouse at Oakland, Md., to Bethlehem Steel Co.

200 tons, factory for the Virginia Mirror Co., Pulaski, Va., to the Carolina Steel & Iron Co.

190 tons, power house for Pacific Gas & Electric Co., San Francisco, to Moore Dry Dock Co.

150 tons, bridge for the Norfolk & Western, to the Virginia Bridge & Iron Co.

150 tons, shop building for the Central Railroad of New Jersey, at Elizabethport, N. J., to an unnamed fabricator; the Tilt-Hargan Co., 90 West street, New York, is general contractor.

150 tons, small jobs in Pittsburgh and vicinity, to the Pittsburgh-Des Moines Steel Co.

150 tons, rod building, Allegheny Steel Co., Brackenridge, Pa., to the McClintic-Marshall Co.

140 tons, power house for Great Western Power Co., Twentieth and Telegraph streets, Oakland, Cal., to Golden Gate Iron Works.

135 tons, Masonic Lodge addition, Berkeley, Cal., to Herrick Iron Works.

124 tons, smoke stacks, breechings and steel supports for Illinois Power & Light Corp., Venice, Ill., to an unnamed fabricator.

120 tons, garage at Broadway, Oakland, Cal., to Herrick Iron Works.

STRUCTURAL CONTRACTS PENDING

10,000 tons, Rickard office and stadium structure, Eighth avenue, between Forty-ninth and Fiftieth streets, New York; bids to be asked in six to eight weeks. Weinberger & Weishoff, 345 Madison avenue, New York, are engineers.

2000 to 5000 tons, bridge replacements, Pittsburgh; bids to be asked in 30 to 60 days.

4000 tons, Illinois Athletic Women's club, Chicago, bids shortly; Schmidt, Garden & Martin, 104 South Michigan avenue, Chicago, architects.

3000 tons, plates, tank work for Standard Oil Co., Buffalo; pending.

3000 tons, teachers training school, New York; Emil Diebitsch, 70 East Forty-fifth street, New York, low on general construction.

2000 tons, plates and shapes, work under contemplation in northern Ohio; being figured.

1900 tons, storehouse for the government quartermaster's department, San Francisco; bids asked.

1500 tons, school No. 173, New York, including subway section underneath, general contract awarded Rosenthal Construction Co.

1200 tons, Athens Athletic club, Oakland, Cal.; pending.

1000 tons, National Bible institute, New York; project revived. John Lowry, 270 Madison avenue, New York, general contractor.

1000 tons, repairs to ore bridges at Lorain, Conneaut and Ashtabula, O.; pending.

1000 tons, Knights of Columbus club, Eighth avenue and Fifty-first street, New York; general contractors' bids asked.

850 tons, power house for the United Illuminating Co., Bridgeport, Conn.; award expected shortly.

800 tons, loft for Marx Bros., Brown's place, between 132nd and 133rd street, New York; pending.

800 tons, bridgework for the New York Central railroad; action temporarily held up.

700 tons, bank building, Boston; bids being taken.

600 tons, bridge for the Big Four railroad at Vincennes, Ind.; Wisconsin Bridge & Iron Co., low bidder.

600 tons, two buildings for Syndicate Trading Co., New York; preliminary figures asked. Cross & Cross, 385 Madison avenue, New York are architects.

600 tons, hotel, Fifteenth and Harrison streets, Oakland, Cal.; pending.

600 tons, building for United Light & Power Co., Davenport, Ia.; bids in.

500 tons, junior high school, Trenton, N. J.; bids asked.

500 tons, school, Lowville, N. Y.; pending.

400 tons, garage at 177th street and Broadway, New York; Weinberger & Weishoff, 345 Madison avenue, New York; engineers.

300 tons, alterations to power plant at Devon, Conn.; bids in.

235 tons, building for the Citizens' Title & Trust Co., Uniontown, Pa.; general contract awarded the Mellon-Stuart Co., Pittsburgh.

200 tons, bridge over Bogachiel river, Olympic forest reserve, Wash.; bids in June 26.

200 tons, foundry addition, state penitentiary, Baltimore, bids in.

200 tons, work for Sandusky Cement Co., Cleveland; pending.

150 tons, Nooksack bridge, Bellingham, Wash.; bids in.

150 tons, addition, Rhode Island Malleable Iron Works, Hillsgrove, R. I.; bids being taken.

100 tons, theater building for J. B. Bigglo & Sons Steubenville, O.; general contract awarded the R. R. Kitchen Construction Co., Wheeling, W. Va.

Tonnage unstated, 16-story hotel, Citizens Hotel Corp., Durham, N. C.; Blackford Construction Co., Durham, awarded general contract.

Sells Butt Weld Plant

Assets of the Cleveland Steel Tube Co.'s plant located on a 21 acre site paralleling the Erie railroad at 144th street, Cleveland, have been sold to Morris G. Songer of Pittsburgh and associates. The purchasers plan to organize the Union Tube Co. under the laws of Ohio with a capitalization of $300,000. The plant was built in 1920 by the International Steel Tube Co. for the manufacture of butt weld pipe and some of the equipment was installed. Owing to financial difficulties the International company failed. The holdings were purchased by Cleveland interests and the name changed to the Cleveland Steel Tube Co. The new owners will purchase sufficient equipment to round out one butt weld mill and if present plans materialize they expect to place the mill in operation about Oct. 15.

Equipment Buying Better

Award of 1000 Steel Hopper Repairs by Sandy Valley Leads Car Transactions—Track Accessory Market Hold Steady—Locomotive Inquiry Grows

RAILROAD TRACK MATERIAL PRICES, PAGE 1663

New York, June 24.—Car demand is quiet, there being little in the way of orders or inquiries. Repair work is featured by a contract for the repair of 1000 all-steel hoppers for the Sandy Valley & Elkhorn Railway Co. More locomotive inquiry is in the market than for some time. The Seaboard Air Line has come out for 30 and the New York Central now is negotiating for. The Boston & Albany awarded four switchers to the American Locomotive Co.

The New York Central railroad will open bids July 1 on steel for third-quarter. The inquiry calls for a maximum of 250 tons of sheets; 1000 tires, 10,000 seamless steel tubes, 1000 car axles, a large number of cast iron car wheels; 1000 tons of bars, plates and shapes and a large quantity of spikes.

Order Receipts Slim

Pittsburgh, June 24.—Light rail buyers' needs still are limited. Single carloads are the rule. Coal mine operators are not anticipating their wants, it being possible to obtain prompt deliveries, and the 1.90c base Pittsburgh price promises to remain the market. Makers of rail-steel light rails are quoting $2 or $3 per ton under that figure; consequently, a number of orders is going in that direction.

Track accessory demands are slim. A few small orders were placed for spikes but most railroads have covered their requirements for the near future. Prices are unchanged.

Some Track Material Released

Chicago, June 24.—Determined efforts by makers of track fastenings in this district have resulted in releasing some bookings and one western line has taken a fair tonnage of spikes, but, on the whole, railroad buying is extremely light. Rail tonnage is being worked off rapidly. The heartening aspect is that railroad stocks are almost dangerously low and some buying must be done shortly. One maker of steel car wheels booked fair business last week.

Slightly improved activity is noted in the car market. The American Car & Foundry Co. has taken 100 ballast cars for the Florida East Coast railroad and 20 passenger cars for the Wabash railroad.

Carl R. Gray, president of the Union Pacific railroad advises that construction on the Wells-Rogerson cut-off will go forward without delay. The contract has been awarded to the Utah Construction Co., and involves an outlay of between $3,500,000 and $4,000,000. The work includes 97 miles of new track to connect the Union Pacific lines at Rogerson, Idaho, and Wells, Nev.

CAR ORDERS PLACED

Florida East Coast, 100 ballast cars, to American Car & Foundry Co.

Central of Vermont, 12 caboose underframes, to American Car & Foundry Co.

Detroit-Edison Co., 6 gondolas, to the Pressed Steel Car Co.

Delaware, Lackawanna & Western, 40 cabooses, to the Mt. Vernon Car Mfg. Co.

Chesapeake & Ohio, 100 cabooses to the Standard Steel Car Co. and 4 diners to the Pullman Car & Mfg. Corp.

Wabash railroad, 20 passenger coaches, to the American Car & Foundry Co.

Sandy Valley & Elkhorn Railway Co., repairs to 1000 all-steel hoppers, to the Youngstown Steel Car Co.

Carnegie Steel Co., 30 hopper car bodies, to the Warren Steel Car Co.

Denver & Rio Grande, 90 cars, to the Standard Tank Car Co.

CAR ORDERS PENDING

Great Northern, 100 underframes for automobile cars; bids asked.

Chicago, Rock Island & Pacific, repairs to 146 dump cars; bids asked.

War department, eight narrow gage motor cars; bids asked.

Western Fruit Express, 1000 underframes; bids in.

Missouri Pacific, revises inquiry to include 2000 refrigerator cars and 1000 box cars; pending.

Baltimore & Ohio railroad, 80 suburban cars; bids in.

Ferro Market Dull

Weaker Quotations Appear as Demand Continues Lacking

FERROALLOY PRICES, PAGE 1663

Pittsburgh, June 24.—Decided dullness continues to characterize the ferroalloy market. Practically no inquiries are coming out although once in a while a ferfomanganese consumer will buy a carload for prompt needs. Prices so far as can be ascertained are firm at $107.50, although slight concessions in the matter of delivered prices, to make even figures particularly in eastern sections, amounting to 12 to 50 cents per ton, sometimes are made. The minimum therefore is $107, seaboard base. The Andrews Steel Co., bought 100 tons of English metal and is understood to have paid the full price, $107.50 c.i.f. Atlantic seaboard, duty paid. As yet buyers are not coming into the market for their third quarter needs.

No change is noted in the spiegeleisen situation, demand and prices being unchanged. The special alloys, ferrotungsten, ferrovanadium, ferrophosphorus, etc., all are inactive. Occasionally a ferrosilicon purchase for filling-in purposes is made although most users are receiving shipments on contracts. The price still is $75, freight allowed.

Business Almost at Standstill

New York, June 24.—Business in the special ferroalloys and alloy ores remains almost at a standstill, due to the lull in the automotive and high speed steel trades. Prices have changed little in recent weeks, but an easier tendency is observed in ferrotungsten and tungsten ores. Ferrotungsten now may be quoted 88 to 90 cents a pound contained; tungsten concentrates, $8.25 to $8.50 a short ton unit for average Chinese wolframite. Shipments on ferrochrome and ferrosilicon contracts are at the lowest rate of the year.

Spiegel Is Weaker

Chicago, June 24.—Spiegeleisen is somewhat weaker and where $35, furnace, has ruled $34 now seems the more accurate quotation. Ferromanganese continues at $107.50, seaboard. Activity is largely in carload lots.

The Nonferrous Metals

Consumption Declines and Prices Fall—Copper Unusually Low—Zinc Firms Up and Then Slips

	Copper—Electro delivered	Copper—Lake delivered	Spot tin Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Spot nickel
June 18	12.62½	12.87½	43.25	7.00	5.80	26.50	8.37½	28.00
June 19	12.50	12.75	42.62½	7.00	5.72½	26.50	8.37½	28.00
June 20	12.50	12.75	43.00	7.00	5.72½	26.50	8.37½	28.00
June 23	12.50	12.75	43.62½	7.00	5.75	26.50	8.37½	28.00
June 24	12.40	12.70	43.12½	7.00	5.75	26.50	8.37½	28.00

†Outside market quotation.

NEW YORK, June 24.—With the decline in American consumption of metals which has accompanied the general slowing down of business this spring, the metal markets in this country have been more susceptible than ever to the influence of the foreign markets. Of late, the copper, zinc, lead and tin markets have been following closely the tendency of the London market, which in turn, while serving as a barometer of world conditions has viewed bearishly the decline in activity here.

The business in metals here has been confined largely to nearby wants, despite the low levels to which prices have declined, especially copper and zinc. Only once in a decade has copper broken below its present price level. Tin is nearly 50 per cent below its high for the year while lead is 30 per cent below its high for the year.

Electrolytic copper rose temporarily to 12.62½c, delivered Connecticut, last week, with sales at that level, later reacting again to 12.50c, and in some instances to 12.37½c. The lower price for copper and the competitive condition of the rolled products market caused a reduction of ½ cent in all copper and brass products excepting sheets, which declined ¾ cent. An increase in the discounts off the list of extras also was announced, from 25 to 33 1/3 per cent. Rolling mills are operating between 50 and 60 per cent. Wire business is relatively better than copper, though also highly competitive. Anaconda Copper Mining Co. has just begun operating a new wire mill at Kenosha, Wis., while Baltimore Copper Smelting & Rolling Co. is contemplating a large new mill at Baltimore. New business in scrap copper and brass has been slow, though dealers are reluctant sellers due to the low prices. Foundries continue to buy casting copper and composition ingot only against urgent needs. Casting copper sold at 12.25c, refinery.

The zinc market rose temporarily to 5.85c, East St. Louis, some export business being done on the rise. British buyers took about 1500 tons, when the London market again declined and ours followed it, perhaps to prevent arbitrage sales of the metal previously sold for shipment abroad. Prime western has sold the past few days at 5.70c to 5.75c, East St. Louis, for prompt, June and July shipment.

Lead prices have again eased off, following lower London prices which in turn resulted from heavy commitments by British dealers as well as British consumers. Though some sales of lead were made in the open market a week ago at 7.25c, New York, subsequently the market declined to 7c for shipment through August, this being the same as the official contract price of the leading interest. Operations of storage battery makers have slowed down appreciably, reflecting the slower automobile demand. In the Middle West, business has been done at 6.80c, East St. Louis, for June and July shipment.

Tin has been one of the dullest items on the list. Prices have fluctuated between 43c and 44c, with a fairly strong London market, said to be due to buying by a prominent operator who helped bring about the recent bear movement. It is expected supplies in this country this month will exceed deliveries by close to 2000 tons.

Antimony has ranged from 8.37½c to 8.50c, duty paid, for spot, with almost no demand.

Virgin ingot aluminum, 98 to 99 per cent, is offered at resale at 26.50c, Detroit, with inquiry slow. The direct sellers continue to quote 27c.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min..	19.50
High brass	16.25
Zinc, ga. 9 to 18 (plates ½c less)	9.50
Lead, full sheets (cut ¼c more)	10.75
Aluminum, bright, 0 to 35 gage..	37.50 to 92.00
SEAMLESS TUBES	
High brass	20.50
Copper	21.75
RODS	
High brass, round, ⅜ to 2½-inch	14.00
Naval brass rods	16.75
WIRE	
Copper	14.75 to 15.375
High brass	16.75

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	8.25 to 8.75
New York	7.75 to 8.00
Chicago	8.00 to 8.37
HEAVY YELLOW BRASS	
New York	6.00 to 6.25
Chicago	6.25
Cleveland	5.75 to 6.00
ZINC	
New York	3.50 to 3.75
Cleveland	3.00 to 3.25
Chicago, dross	4.25
HEAVY COPPER AND WIRE	
Cleveland	9.75 to 10.00
New York	10.00 to 10.25
Chicago	10.00
RED BRASS TURNINGS	
New York	7.50 to 7.75
Cleveland	7.50 to 7.75
Chicago	7.50 to 7.75
YELLOW BRASS TUBING	
Cleveland	6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.50 to 6.75
Chicago	6.25 to 6.50
ALUMINUM BORINGS	
Cleveland	10.00

Secondary Metals

Casting copper, refinery	12.25
Remelt aluminum No. 12	21.00 to 22.00

Distillates Steady

Due To Reduced Output—Sulphate Market Continues Dull

New York, June 24.—The market for light oil distillates is fairly steady. Conditions in the fuel oil industry are unsettled and industrial demand for distillates is slack. These influences are offset in a substantial measure by a steady curtailed production, as a result of lighter operations in the steel industry.

Pure benzol may be quoted at 24 to 25 cents, works, in tanks and 30 cents in drums; 90 per cent, 22 to 23 cents works, in tanks and 28 cents in drums; xylol, 28 cents, works, in tanks and 33 cents in drums; toluol, 26 cents in tanks and 31 cents in drums; and solvent naphtha, 25 cents in tanks and 30 cents in drums. Virtually all trading is for nearby shipment.

Dullness again features the sulphate of ammonia market. Small lots for domestic consumption are going at $2.45 to $2.55, works. Export business remains listless, with the market holding nominally at $2.55 to $2.60, port, in double bags. Little interest is shown by the fertilizer producers in making their regular contracts.

Seasonal dullness is becoming more pronounced in the naphthalene market. While some sellers still are quoting 6½ cents, works, for flakes and 7½ cents for balls, these prices can be shaded with little difficulty. The market appears more truly represented by a price of 5½ cents, works, for flakes and 6½ cents for balls. The situation in phenol is featureless, with spot supplies going at around 29 cents local warehouse and future business at 25 cents, works.

Coke Oven By-Product

Spot*	
Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.24 to $0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.28
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.05½
Naphthalene balls	0.06½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.45 to $2.55
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.25
Naphthalene flakes	0.05½
Naphthalene balls	0.06½

*Spot distillates are subject to shading.

Harry F. Miller has been appointed receiver of the Econometer Mfg. Co., Orange, N. J., which manufactured two inventions of Thomas A. Edison Jr., a gasoline saving apparatus, and a period timer for Ford automobiles.

Business Dull on Coast

Summer Lull Felt in Every Line—Considerable Construction Pending in All Cities—Some Warehouse Prices Marked Down

SEATTLE, June 20.—General business conditions on the North Pacific coast remain unchanged. The midsummer lull has appeared earlier than usual. Crop reports, both in California and the Northwest, are unfavorable. June 1 estimates for California grains were the lowest on record. California wheat is not expected to exceed one-fifth of the 1923 yield while Oregon and Washington are estimated to raise about 60 per cent of last year's record yield.

Statistics covering building construction in May on the North Pacific show Seattle with $4,758,170 against $1,867,280 in May, 1923. Spokane and Tacoma also made noticeable increases. San Francisco and Sacramento gained over May last year. Los Angeles made the largest loss, $8,789,932 as against $18,926,881 in May, 1923.

The week's important building announcements in Seattle include the construction of a 4-story reinforced concrete building for the Great Northern railway to be used as a postoffice terminal, costing $150,000, and a 5-story apartment house to cost $175,000. Contracts for the new chamber of commerce building, to cost $250,000, were signed this week. The Washington Iron Works has awarded the contract for a $25,000 office building, one of the units of that company's new and modern plant. Bids for the Eagles' $1,000,000 temple will be opened July 8. Several other large construction contracts are pending.

Pig Iron and Coke

The market is quiet, foundries being well stocked. Importers regard the outlook as fairly favorable with prices low and buying likely to be resumed shortly. The best grades of British iron are being quoted at $32. With exchange firming the market has a stronger tone. Continental iron is quoted here at $29 but there is little interest as consumers have their immediate wants well covered.

Reports from San Francisco state the pig iron market is quiet, inquiry being limited. Belgian iron is quoted at $26 and Scotch at $29 to $30. The Southern Pacific has an inquiry out for 500 tons of foundry iron.

The coke situation is unchanged. The prospects are that if the labor troubles at Fernie, B. C., are settled supplies from that source will be available about July 15. In the meantime sufficient foreign coke is arriving to avert shortage.

Bars, Plates and Shapes

Concrete bar awards of the week totaled 1025 tons. Business pending is limited. In the northern district demand for reinforcing bars continues fairly active. Structural shape awards of the week totaled about 2000 tons and awards pending aggregate 2150 tons. The Union Bridge Co., Seattle, was the low bidder on the Albany, Oregon, bridge at $245,306. This project involves 750 tons. It is reported that the steel will be furnished by the Virginia Bridge & Iron Co. It was reported last week that the award for 400 tons for the Country club, San Jose, Cal., went to the Schrader Iron works. This was in error as the Moore Dry Dock Co. booked the business. In the San Francisco district prices are reported stable, shapes at 2.60c and plates also at 2.60c. Now and then slight concessions are made on larger tonnages. In the northern territory the market on structurals is reported 2.60c and on plates 2.55c.

Warehouse

Wholesale jobbers in the Seattle district report business rather slow. Prices are unchanged. Light sheets, plates, rivets, bolts and boiler tubes are in fair demand. San Francisco warehouses have reduced the prices on sheets 15 to 50 cents per 100 pounds. Bands have been cut from 4.50c to 4.25c. In the Los Angeles territory large machine bolts have been cut from 40 off to 45-5 off and small machine bolts from 45 off to 50-5 off.

Preliminary cost estimates are being taken by Seattle engineers for furnishing 2000 tons of water pipe for the Cedar river system. New inquiries for cast iron pipe include 8568 tons of 4 to 24-inch pipe for Los Angeles, bids to be opened June 20. Pending tonnages on this coast exceed 10,000 tons.

There is an inquiry in the San Francisco market for 2500 tons of 70-pound rails. This is suspected to be an order for a large Washington logging company anticipating considerable building. Board of Harbor commissioners, Los Angeles, will open bids on June 27 for 2000 tons of 75-pound A. S. C. E. rail.

Old Materials

The market in this district continues to show weakness. Prices of steel scrap have declined to $9 gross ton for the best grades. Prices are so low that little material is being shipped in from any distance as it cannot afford to pay the freight. No. 1 cast iron is quoted at $19 to $20 with demand light. Similar conditions are reported from San Francisco where the prices of cast iron have receded from $25 and $26 to $20.

The city of Seattle is in the market for 75 tons of copper wire, and one set of steel bridge castings.

Scrap Prices Steady

(*Concluded from Page* 1664)

ment of scrap on old contracts are light and show mills are not badly in need of supplies.

Still Dull at Cincinnati

Cincinnati, June 24.—Iron and steel scrap continues sluggish, as users apparently have a fair supply on hand, coming into the market only as immediate requirements dictate. Particular dullness still prevails in cast, while turnings and borings are difficult to sell at any price. While prices have been largely unchanged, a few downward revisions have been noted. Increased activity in other markets the past week has strengthened conditions here. Foundries are taking occasional small lots for spot use. Railroad scrap is being bought by dealers to fill out contracts or to lay down in yards although this class of buying is not so apparent as a fortnight ago. Mills across the river are not accepting shipments with regularity. Several have requested dealers to hold back on deliveries for the present.

St. Louis Market Better

St. Louis, June 24.—The past few days have developed some improvement in the iron and steel scrap market, based upon a growing belief that the bottom has about been reached. Whereas the industries were not disposed to buy beyond immediate needs, they are seeking bargains, and under cover have picked up some fair sized tonnages. Dealers are more active, speculative interest having appeared. Railroad scrap is meeting ready sale, and much is being laid down in yards.

Actual sales continue hand-to-mouth and are not impressive in the aggregate. Operations at mills and foundries are being further curtailed, and active plants in a number of instances are well provided, some having scrap sufficient to carry them well into fourth quarter under present demand.

Scrap suitable for blast furnaces, steel specialties and melting rails are most active. Prices on these grades were marked up 25 cents to $1 per ton from the recent extreme depressed levels. Re-rolling rails are displaying a bit more life, though quotably unchanged. All cast grades continue about as dull and listless as during the past two months.

As has been the case since the commencement of the recent downward movement, arrivals of country scrap are at a minimum. Virtually nothing has arrived from southern shipping points since the first of the month. Railroad lists include the Frisco, 26 cars; Cotton Belt, 55 cars; Baltimore Ohio, 13,000 tons and Chicago, Burlington & Quincy, 5000 tons.

Some Scrap Scarce

Birmingham, Ala., June 23.—A little buying of No. 1 cast and stove plate gave encouragement the past week. Purchasers practically name the price but dealers are accepting some of the business. Turnings and borings have had a little call but both are at a low ebb. Heavy melting steel is lagging and $11 and lower is heard. Some of this product is being delivered now which was sold at $4 to $5 per ton higher several months since.

Quiet At Cleveland

Cleveland, June 24.—Iron and steel scrap is quiet in this district. Demand is almost entirely lacking, neither dealers nor consumers seeking tonnage beyond spot needs. Prices have a strong undertone with indications of consumer buying soon.

Edward P. Morse Jr. and Frank J. McConnell have been appointed ancillary receivers in equity for the National Dry Dock & Repair Co., Inc., West Brighton, Staten Island, N. Y.

End Pittsburgh Plus Argument

Final Pleas Made To Federal Trade Commission Before Consideration and Decision—Counsel for Commission Stresses Effect on Freight Rate Adjustment—Corporation Attorney Warns Question Is on Violation of Law

WASHINGTON, June 24.—Arguments on the complaint of the federal trade commission against the United States Steel Corp. and its subsidiaries in its practice of basing quotations on Pittsburgh base, the so-called "Pittsburgh plus" case which has been before the commission several years were closed today.

W. W. Corlett of counsel for the Steel corporation in his presentation declared quotations on an f.o.b. mill basis would vary and would work similarly to Pittsburgh plus. They would tend to make prices cheaper to the distant consumer who absorbs the freight. Richard V. Lindabury warned the commission the importance of determining whether there is a violation of the Clayton law or the federal trade act and not to be influenced by conflicting testimony. He said Pittsburgh plus does not involve an agreement among producers and that departures always exist in this method of quoting steel prices.

H. G. Pickering, Superior, Wis., counsel for the Western Association of Rolled Steel Consumers, said the Steel corporation discriminates among customers through Pittsburgh plus and that the American Bridge Co. controls the fabricating business of the country, doing 40 per cent of the total business. He said Pittsburgh plus restricts competition in both the production and manufacture of steel into finished products until there is no national steel market.

Attorney K. E. Steinhauer, of counsel for the commission, said the Steel corporation should split with the railroads the imaginary freight exacted from consumers by means of Pittsburgh plus.

Effect on Freight Rates

Mr. Lindabury called attention to the fact that if the change to f.o.b. mill should be made over night it would cause bankruptcies and confusion. Pittsburgh plus, he asserted, involves the free right to trade.

While not admitting that the existence of Pittsburgh plus helps to keep freight rates down, Attorney K. E. Steinhauer, of federal trade commission counsel, yesterday declared that the Steel corporation subsidiaries are hampering the interstate commerce commission in raising railroad freight rates for the benefit of railroads that are "hard pressed," in opening final arguments in the Pittsburgh plus case.

"Every time the interstate commerce commission raises real freight rates," said Attorney Steinhauer, "it finds that the steel companies 'tune in' with their imaginary freight rates and reap a tremendous harvest. An innocent railroad company applied for an increase in freight rates. The commission said in answer to the petition: 'Because of this so-called Pittsburgh basing point for steel prices, an increase in the freight rate from Pittsburgh increases in like amount the price of steel no matter where the purchase is made. This, however, respondents state, is no fault of theirs, and they do not benefit therefrom'."

Mr. Steinhauer also declared that operation of the Pittsburgh plus method of quoting steel prices is a system of extortion maintained by the Steel corporation subsidiaries. He said Pittsburgh plus takes $30,000,000 yearly from farmers in 11 states by making them pay "double Pittsburgh plus prices" for their agricultural implements.

Van Fleet Has Questions

Mr. Steinhauer's arguments were interrupted several times by questions from Vernon W. Van Fleet, a member of the commission, who asked further explanation of Mr. Steinhauer's assertions that Chicago fabricators cannot do business east of Chicago, making it impossible to develop a large structural business in Chicago. Commissioner Van Fleet asked what becomes of the surplus of shapes, plates and bars that does not go to eastern fabricating territory. Mr. Steinhauer replied that Steel corporation subsidiaries in the Chicago district dispose of this surplus sometimes at a loss in Detroit and other points. Bale ties, he said, cost farmers $7.60 a ton more from Chicago plants because of Pittsburgh plus, and $15.30 a ton more in the Birmingham district, although the ties are not manufactured in Pittsburgh.

The remedies for Pittsburgh plus "extortion," said Mr. Steinhauer, are to prohibit the respondents from quoting or selling steel on any base other than that at the producing point; to prohibit the respondents from quoting or selling only at delivered prices, which include freight, and to prohibit respondents from discriminating in prices between purchasers of their products where the effect of such discriminations may be substantially to lessen competition, unless they are made in good faith to meet competition.

Testing Society

In Annual Convention at Atlantic City —New Officers Are Announced

(By Wire)

Atlantic City, N. J., June 24.—With a registration of 500, the American Society for Testing Materials began its annual sessions at the Hotel Chalfonte, Haddon Hall, today. New officers to be announced at the meeting Wednesday night included F. M. Farmer, engineer, New York City, president and J. H. Gibbony, vice president. The new members' executive committee consists of Prof. William Campbell of Columbia university, A. E. Jury, Dr. John A. Matthews and Anson Marston, dean of engineering of Iowa State college.

W. B. Price of the Scovill Mfg. Co., Waterbury, Conn., discussed a white metal alloy for castings and stampings with 130,000 pounds tensile strength.

A symposium on corrosion-resisting, heat-resisting, and electrical resisting alloys featured the opening session. P. A. E. Armstrong presented a paper on "Corrosion-resisting Metals—Past, Present and Future," in which he reviewed the metallurgical developments of chromium-bearing alloy steels, and predicted their future effects on engineering construction. Corrosion-resistant alloys for use in mine water were discussed by R. J. Anderson and G. M. Enos. A paper by D. J. McAdams Jr. described an investigation of noncorrosive steels and alloys to determine the relation of endurance properties to the results of the more common mechanical tests. "Non-Rusting Chromium-Nickel Steels" was the title of a paper presented by B. Strauss, which described the early developments of non-rusting chromium-nickel steels, and discussed the hysical and corrosive-resistant properties of two such steels containing 10 to 16 and 20 to 25 per cent chromium.

The papers entitled, "The Carrying Capacity of Ball Bearings Made of Stainless Steel," by Axel Houtgren, reviewed three series of tests of ball bearings made from stainless steel of slightly different compositions and compared the results of these tests with others made on ball bearings from ordinary carbon-chromium ball steel.

Continental Prices Are Lower

Increasing Stocks and Keen Competition Affecting European Markets—French Mills Take Tonnage of Rails for Tunis at $30.76, Delivered—Germans Book Large Order for Turkey—Japan Placing Tin Plate with British Makers

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, June 24.—Continental competition is bringing down iron and steel prices. The steel stocks of continental producers especially are increasing. The position of the British producers of galvanized sheets is satisfactory, but the market for British pig iron is dull. Japan is placing orders for a considerable tonnage of tin plate.

Paris reports that the De Wendels have sold 3400 tons of rails at 575 francs ($30.76), delivered at Tunis. French railroads have ordered 50 locomotives from French builders. Brussels reports 200 freight cars sold to Brazil. An order for a tonnage of rails has been placed by Turkish interests with the Krupps at a total of 2,000,000 rentenmarks ($460,000). The Germania Werft is reported to have sold three steamers to the Standard Oil Co.

Price changes noted in the British market this week bring the following products to the levels as quoted: No. 3 foundry iron £4 8s ($19.05); basic iron £4 5s ($18.40); hematite £4 16s 6d ($20.81); galvanized sheets £18 (3.48c); plain wire £12 (2.32c); galvanized wire £15 10s (3.00c); furnace coke £1 1s ($4.55).

Sterling exchange is figured on a basis of $4.33.

British Steel Market Dull and Plants Close

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., June 13.—Awaiting policy is still favored in nearly all branches of the iron and steel trade and has been justified. Prices are easier in most departments. Cleveland No. 3 has settled down to £4 10s ($19.44) the lowest figure of the year. That market suffers from uncertainty as to currency movements on the Continent. It seems likely that production will have to be reduced unless the situation improves. In the Furness area two furnaces have been relighted at Barrow, making the total 12. Stocks there have been practically sold out, and the restarting of mills, chiefly for the production of rails, at the Barrow steelworks, increases demand for iron. Against this increase, two furnaces have been extinguished in Monmouthshire, and in no district is the output being entirely absorbed. Barrow-in-Furness is finding export business rather dull outside sales being chiefly to Scotland and South Wales. Practically nothing is being done with America, and very little with the Continent.

Coke prices hold the key to the position. This fuel has become plentiful and makers are keener for business than for a long time past. Durham coke delivered at Middlesbrough can be bought at £1 7s ($5.83) but nobody regards this as a basis price. The Midlands are rather worse off, with an official quotation for furnace coke at £1 4s ($5.18) at the ovens. Sales have been made at £1 2s 6d ($4.86) though it seems likely that the revision of prices due at the end of the month will bring a reduction. But furnacemen want coke much cheaper, and look forward to a reduction of 2s ($0.43) to 3s ($0.64) per ton below the present figure. Derbyshire foundry iron can be got into Lancashire at about the same price as Cleveland No. 3, and that business is once more divided between the two districts. Midland pig irons are easier in price, Derbyshire foundry selling at £4 11s and few sales having been made of Northampton No. 3 at £4 10s ($19.44). East Coast hematite is weak at £4 17s 6d ($21.06).

Sterling—$4.32

Stoppage has been general in the steel trade this week, except for isolated mills. Nearly all the iron rollers have been at a standstill.

English billets continue at about £7 15s ($33.44) delivered, though the price could easily be shaded if demand existed. But nearly all users of steel in the Midlands are loaded up with foreign billets lately delivered on old contracts, and can easily await the further descent in values generally looked for. Foreign competition has become keener. Belgian billets are offered here at £5 17s 6d ($25.38) f.o.b. Antwerp, making the delivered price £6 16s ($29.37) or practically £1 ($4.32) per ton below the English quotation. Joists can be bought at £6 15s ($29.16) Antwerp or £8 ($34.56) delivered, finding a very good market among the builders at about £1 10s ($6.48) below the English price. Antwerp quotations frequently mention material of "German origin." Finished steel selling at £6 15s ($29.16) Antwerp offers an inducement to British merchants able to execute contracts by shipment to various foreign destinations from the port of Antwerp.

The Staffordshire iron trade has seldom been worse, medium iron at £13 ($56.16) being scarcely saleable, though the small quantity of best iron made is finding a sufficient market in engineering and shipyard requirements. A few orders accumulated at Barrow have enabled the rail mills to start after a long period of idleness.

Black sheets are in moderate demand. Scotch makers, who rely chiefly on export, are getting rather bare order books, but can run a few weeks.

The recent reduction in tin plate appears to have been justified by results. The basis quotation continues at £1 2s 7½d ($4.88) some makers however finding it possible to sell at £1 2s 9d ($4.91) up to £1 3s ($4.96) f.o.b. works. Further price cutting is not regarded as at all a likely contingency. Terne plates have been reduced pro rata with tin plate, the basis now being £1 1s 4½d ($4.40) with a moderate business passing.

Slow Deliveries Cause Loss in European Trade

European Staff Special

LONDON, June 13.—Export trade in Great Britain and on the Continent is calm as far as new business is concerned. Although the present time of year is generally not active, the principal reason for restricted demand may be traced to unsettled political conditions on the Continent. Several merchants in Great Britain are beginning to lose interest in continental markets owing to difficulties they have met with in obtaining deliveries which, in certain cases, have caused them to lose money. Following the experiences of the past months, buyers often prefer not to take advantage of lower prices on the Continent and to pass their orders to

Current Iron and Steel Prices of Europe

Prices Converted into Dollars at Rates of Exchange, June 23

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Ports	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d		Francs		Francs		£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$19.05	4 8 0*	$19.26	360	$18.60	400	$22.73	5 5 0
Basic	18.40	4 5 0	20.33	380	17.90	385	25.98	6 0 0
Basic-bessemer	21.65	5 0 0†	19.26	360	17.67	380	27.06	6 5 0
Hematite, Phosphorus 0.02-0.05	20.81	4 16 6	23.54	440	.....	....	24.90	5 15 0
SEMIFINISHED STEEL								
Billets	$30.31	7 0 0	$25.86	480	$26.04	560	$27.06	6 5 0
Wire rods	47.63	11 0 0	37.45	700	33.71	725	32.48	7 10 0
FINISHED STEEL								
Standard rails	$35.72	8 5 0	$32.10	600	$34.88	750	$30.31	7 0 0
Merchant bars	1.69c	8 15 0	1.36c	560	1.28c	605	1.28c	6 10 0
Structural shapes	1.55c	8 0 0	1.36c	560	1.26c	595	1.28c	6 10 0
Plates, ship, bridge and tank	1.74c	9 0 0	1.77c	730	1.56c	740	1.50c	7 12 6
Sheets, black, 24 gage	2.51c	13 0 0	2.79c	1,150	2.74c	1,300	2.85c	14 10 0
Sheets, galvanized, 24 gage, corrugated	3.48c	18 0 0	4.25c	1,750	5.22c	2,475	3.54c	18 0 0
Bands and strips	2.13c	11 0 0	2.00c	825	1.90c	900	2.26c	11 10 0
Plain wire, base	2.32c	12 0 0	2.31c	950	2.32c	1,100	1.96c	10 0 0
Galvanized wire, base	3.00c	15 10 0	3.16c	1,300	2.85c	1,350	3.36c	17 0 0
Wire nails, base	2.80c	14 10 0	2.67c	1,100	2.43c	1,150	2.75c	14 0 0
Tin plate, base box 108 pounds	$4.55	1 1 0	.....	....	.....	....	$6.28	1 9 0
Domestic Prices at Works or Furnace—Last Reported								Reuten Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$19.49	4 10 0	$20.06	375(2)	$18.83	405	$22.72	299
Basic pig iron	19.49	4 10 0	20.60	385(1)	19.07	410	25.42	110
Furnace coke	4.98	1 3 0	7.60	142	8.84	190	7.36	32
Billets	30.31	7 0 0	21.15	470	25.11	540	27.60	120
Standard rails	1.69c	8 15 0	1.40c	575	1.43c	680	1.48c	142
Merchant bars	1.74c	9 0 0	1.40c	575	1.32c	625	1.41c	135
Shapes	1.74c	9 0 0	1.39c	570	1.27c	600	1.38c	132
Plates, ship, bridge and tank	1.84c	9 10 0	1.77c	730	1.58c	750	1.53c	147
Sheets, black, 24 gage	2.61c	13 10 0	2.67c	1,100	2.85c	1,350	2.61c	250
Sheets, galvanized 24 gage, corrugated	3.43c	17 15 0	4.25c	1,750	5.17c	2,450	3.65c	350
Plain wire	2.42c	12 10 0	2.92c	1,200	2.27c	1,075	1.98c	190
Bands and Strips	2.32c	12 0 0	2.00c	825	2.11c	1,000	1.88c	180

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 4s 0d ($5.20) f. o. b. Ferromanganese, £17 0s 0d ($73.61) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

British producers who are more reliable in deliveries. However, shipments are being received from Belgium and France against spring orders.

Great Britain, Belgium and France are keenly competing in pig iron. British Middlesbrough No. 3 foundry pig iron sells for £4 10s ($19.30) per ton f. o. b. furnace; Belgian pig iron of the same description is 400 Belgian francs ($19.30) per metric ton, and Lorraine pig iron is about 375 French francs ($18.80) f. o. b. Antwerp; since exchange rates sometimes vary considerably from one day to another fluctuations in exchange rates more or less govern the situation. British hematite is sold in France at £4 18s ($21) f. o. b. furnace; in taking account of the freight rate this brings the product to 460 francs ($23) per metric ton c. i. f. French channel port which is about competitive with present prices of French hematite. Germany is practically out of the market owing to difficulties in financing her transactions and production costs are such that German prices are higher than those quoted by France, Belgium and Luxemburg. German rails are quoted at the low price of £7 10s ($32.10) per metric ton. f. o. b. Rotterdam or North Sea ports. British rails are £8 5s ($35.40). Prices on French and Belgian rails vary considerably but are lower than either the British or German prices. Belgian rails have been sold at £8 10s ($36.50) c. i. f. Chilean port. German pipe has been sold in India at prices competitive with American prices. Germany is also selling wire products to South America and South Africa.

Conditions in France are not much in favor of export business although some has been done late in May and early in June owing to depreciation of the franc. French billets are only about 470 francs ($23.50) per metric ton and have been sold to Great Britain. Merchant bars have also been exported at about 575 francs per metric ton (1.31c per pound,) f. o. b. Antwerp. Belgium and Luxemburg are offering sheets on the French market at the following prices: 2-millimeter sheets, 885 Belgian francs per metric ton (1.77c per pound); 1.5-millimeter sheets 950 Belgian francs (1.89c); 1-millimeter sheets, 1050 Belgian francs (2.10c) f. o. b. French frontier ex. duty; these prices are competitive. Belgian plate and sheet makers are not doing much business as their books still are pretty well filled. Luxemburg iron and steel makers are feeling some anxiety about financial conditions in Germany which is one of their most important export markets.

Rules on Cold Drawn

Toronto, June 24.—The Canadian department of customs, Ottawa, has issued the following ruling: Ruled that no cold-drawn steel is to be entered as shafting, and a declaration to that effect is to be placed on the entry. Cold-drawn iron or steel ⅜-inch in diameter or over, and not in coil, is not considered to be wire.

French Exports Better

Paris, June 12.—French exports of pig iron in April were 75,740 metric tons, about 6 per cent in excess of March but 18 per cent less than in February when the highest mark was reached with 92,409 tons. The value of pig iron exports in April was 34,940,000 francs (about $1,900,000). Steel exports in April including scrap dropped to 258,737 metric tons, 6 per cent less than in the preceding month; this tonnage was valued at 171,305,000 francs (about ($9,500,000). A large part of this export tonnage was shipped against orders and contracts passed in February and March.

Imports of pig iron in April were 3423 metric tons worth 1,613,000 francs (about $900,000) and imports of steel were 58,981 metric tons valued at 50,226,000 francs (about $2,800,000).

Comparisons with previous months are as follows:

	Metric Tones			
	—Imports—		—Exports—	
Monthly average	Pig iron	Steel	Pig iron	Steel
1922	4,955	56,085	60,060	172,585
1923	5,300	55,300	49,400	153,850
1924				
January	8,001	67,502	51,763	172,373
February	3,386	73,292	92,409	203,166
March	1,650	58,990	71,541	274,960
April	3,423	58,981	75,740	258,737

Tax Law Further Analyzed

Application to Individuals, Estates, Trusts, Gifts and Miscellaneous Purposes Described

BY H. ARCHIBALD HARRIS

PROVISIONS of the new tax law just put into effect were described June 12 in IRON TRADE as they apply to corporations and generally as to every class of taxpayer.

In the present and concluding installment of the digest of the new law the application of the tax to individuals and to various miscellaneous purposes is set forth and changes from the 1921 law are pointed out.

Sections used after paragraphs are sections of the new 1924 law, except where otherwise stated. For brevity little comment is given, only bare changes from the preceding law being shown.

How New Tax Law Affects Individuals

Capital Gains and Losses

Definition capital loss same as 1921 act, except does not specify sale or exchange shall have been consummated since Dec. 31, 1921.

"Ordinary deductions" defined as all deductions under section 214, except capital deductions.

Capital net gain is the excess of capital gain over sum of capital deductions and capital losses plus (a) any excess of ordinary deductions over gross income not including capital gain. (a) is new.

"Capital net loss" means the excess of the sum of the capital losses plus capital deductions over the amount of capital gains.—Section 208 (a) (5).

Under the new law it appears that property held for personal use may be a "capital asset" under this section. The 1924 act precludes property held primarily for sale in the course of the taxpayer's trade or business from being considered "capital assets."—Section 208 (a) (7).

Taxpayers other than corporations are allowed capital losses only to the extent of capital gains. Section 206 (a) (2).

Credits Allowed for Normal Tax Purposes

Dividends paid by a corporation organized under the China Trade act are not allowed as credit for normal tax purposes as are other dividends.—Section 216 (a).

Married person or head of family—$2500.

Personal exemption allowed United States citizens or residents—$1000 or $2500—shall, if status of taxpayer changes during year, be changed also. If he was single four months and married eight months, he has one-third of $1000 plus two-thirds of $2500. The month in which the change occurred shall be counted according to which status occupied the greater portion of the month.—Section 216 (f) (2).

Deductions

Contributions by individuals to fraternal societies, etc., operating under a lodge system or to a trust shall be allowed as deductions if the contributions are used for religious, scientific, educational or other named purposes.

Deductions shall not ordinarily exceed 15 per cent of the net income but if in the taxable year and in each of the ten preceding years the amount of contributions combined exceeds 90 per cent of the taxpayer's net income for each year, then the full amount of such contributions shall be allowed.—Section 214 (a) (10).

Earned Income

Earned income is any compensation for services actually rendered—does not include amounts received by a stockholder of a corporation which represent distribution of profits rather than compensation for services.

Where a taxpayer is engaged in a trade or business and both personal services and capital are material income-producing factors a reasonable allowance as compensation for the services of the taxpayer shall be considered earned income, such "earned income," however, not to exceed 20 per cent of his share of the net profits of the trade or business.—Section 209 (a) (1).

"Earned income deductions" means any deductions under section 214 properly allocable to earned income.—Section 209 (a) (2).

"Earned net income" excess of earned income over earned income deductions.

If taxpayer's net income from all sources is not more than $5000 it shall be considered earned net income.

If the net income is more than $5000 at least $5000 of it shall be treated as earned net income.

Earned net income shall never be more than $10,000.—Section 209 (a) (3).

The method of handling partnership earned income is put up to the commissioner who is authorized to draft regulations.—Section 209 (c).

An individual shall receive as a credit against his normal tax 25 per cent of the amount of the tax computed on his earned income at regular rates. Such credit shall in no case be more than 25 per cent of his normal tax.—Section 209 (b).

Fiscal Years of Partnership

Partnership has a fiscal year. If the law in first part of fiscal year is different from the law in the second part, the partnership shall compute its income under the laws applicable to both. The partners shall report that proportion of the income computed in each year which corresponds to the number of months in each calendar year falling within such fiscal year.

Partnership income taxable at rates for the second year shall be added to the other income for the second year and the total placed in the lower brackets for such year. The part of such income subject to the rates for the preceding calendar year shall be placed in the next higher brackets of the rate schedule applicable to that year. (This shall be included in the taxpayer's income return for the calendar year during which the fiscal year of the partnership ends.)—Section 207 (b).

Gain or Loss

If in a reorganization money or other property is received together with the stock of a corporation, a party to the reorganization so that gain or loss may result (Section 203 (d) (1), any part of the gain covered by earnings or profits accumulated since Feb. 28, 1913 shall be taxed at surtax rates only; any gain not covered by such earnings or profits shall be subject to both normal and surtax.—Section 203 (d) (2).

Income—Gross

A person having tax-free securities must submit with his return a statement showing the number and amount of such obligations and the interest received.—Section 213 (b) (4).

Provision is made for refund to states or municipalities of tax paid by public utilities on income accruing to the state or municipality.—Section 213 (b) (7).

Payments under the World War Veterans act, 1924, are exempt—also state pensions. (This last provision

does not appear to be necessarily a war pension.)—Section 213 (b) (9).

In order that an exemption of $300 income per year be allowable the domestic building and loan association shall be one "substantially all of the business of which is confined to making loans to members" instead of one which is operated exclusively for such purposes as under 1921 act.—Section 213 (b) (10).

If a citizen of China, residing therein, receives dividends from a corporation organized under the China Trade act, 1922, the stock of the corporation being in good faith vested in him, such dividends are exempt from surtax.—Section 213 (b) (13).

Net Losses

If a taxpayer other than a corporation has in the second year a capital net gain, the net loss of the prior year shall first be used as a deduction in computing income for such "second year." If such net loss exceeds the ordinary net income such excess shall be applied against the capital net gain for such year and any excess loss shall be carried over to the "third year."—Section 206 (c) (2).

A capital net gain in the "third year" is handled by a taxpayer other than a corporation in the same manner as in the "second year."

If a taxpayer (other than a corporation) has, in the second year sustained a capital net loss, the deduction for a net loss sustained in the prior year shall be used in computing the ordinary net income of the second year. If the deduction is in excess of the ordinary net income such excess shall be allowed as a deduction for the third year.—Section 206 (c) (1).

If a capital net loss is sustained, the taxes shall be computed as follows:

The tax should be computed on the ordinary net income at regular rates. From this shall be subtracted 12½ per cent of the capital net loss.—Section 208 (c).

Rates of Tax—Normal Tax

Rates for American citizens:

	1921 Act Per cent
2 per cent on first $4000 above exemptions and credits.....	4
4 per cent on next $4000	8
6 per cent on rest of income...	8

Rate for non-resident aliens:

6 per cent on all taxable net income in excess of $1000	8

Rates for non-resident aliens residing in Canada or Mexico:

Two per cent on (salaries, wages, etc.) first $4000 in excess of $1000 plus any credits for dependents.

Four per cent on next $4000 salaries, wages, etc. (not all kinds of income).

Six per cent on all salaries and wages in excess of $8000, above $1000, plus credit for dependents.

Six per cent on all other income in excess of personal exemptions ($1000 plus credits for dependents).—Section 210.

Surtax

Surtax begins at $10,000 net income. 1921 began at $6000.

From $10,000 to $14,000 rate is 1 per cent.

One per cent is added for each $2000 until $500,000 is reached.

All net income over $500,000 is subject to 40 per cent.—Section 211 (a).

Returns

Married persons living with husband or wife must file a return if the net income is $2500. (1921 law $2000.)—Section 223 (a) (2).

Joint return provision same as 1921 act except net income raised from $2000 to $2500.—Section 223 (b).

Returns for period less than twelve months:

Commissioner is empowered to make regulations prescribing method of computing tax on such returns where during the fractional part of a year covered by a return the taxpayer has had a capital net gain, sustained a capital net loss or has received earned income.

In cases of fractional returns not due to changes of accounting period the personal exemptions and credits for dependents are prorated.—Section 226 (e).

Tax Paid at Source (Withholding)

Rate of withholding on salaries, wages and other fixed and determinable annual gains of a *non-resident alien*—6 per cent instead of 8 per cent as under 1921 act.

Withholding returns due March 15.—Section 221.

Estates, Trusts, Gifts and Miscellaneous

Net Income

In computing net income of an estate or trust there shall be allowed in addition to other charitable deductions, amounts which under the will or deed of trust are to be used for religious purposes or for prevention of cruelty to children or animals or to a public cemetery not operated for profit, (not necessarily contributions to an organization).—Section 219 (b) (1).

In computing the income of any *estate or trust* a deduction shall be allowed for the amount of income which during its taxable year *is to be distributed currently* and the income collected by the guardian of an infant which is to be held or distributed as the court may direct, any such amount to be reported by the beneficiary whether received by him or not.—Section 219 (b) (2).

Discretionary trusts are allowed a deduction for amounts properly paid or set aside for any beneficiary.—Section 219 (b) (3).

If no part of the income of the estate or trust is included in computing the net income of a beneficiary the credits for dividends and interest on United States obligations are allowed in computing the normal tax of the trust.—Section 219 (c).

Returns of Estates

An estate or trust which has a *gross* income of $5000 must file a return regardless of its net income. Also must file a return if net income is $1000.—Section 225 (a) (5).

Tax Paid

Tax shall be computed upon the net income of the trust or estate and shall be *paid by the fiduciary* with two exceptions which are (1) where the grantor of a trust has the power to revest in himself the title to any part of the corpus of the trust and (2) where the grantor may claim the income of the trust or where the income of the trust may be used to pay premiums on insurance policies on his life (except those irrevocably made to charities or such organizations.) (In these two cases the grantor must include the income of the trust in his return.)

Gift Tax

Beginning Jan. 1, 1924, gifts in excess of specific exemptions are taxable. Rates are 1 per cent of the gift not in excess of $50,000 to 40 per cent of the gift in excess of $10,000,000.—Section 319.

Gift tax is payable on or before March 15.—Section 324.

Residents of the United States shall pay on sum of all gifts made in the calendar year in excess of exemptions. Non-residents on all such gifts of property located in the United States.

Gifts made in property are to be taken at fair market value at date of gift.

Where property is sold or exchanged for less than its money's worth the excess of fair market value of the property over the amount received shall be deemed a gift.—Section 320.

Exemptions Allowed

American citizens or residents.

(1) $50,000.

(2) Charitable (etc.) gifts.

(3) Gifts of $500 or less to any person.

(4) Any gift of property which the taxpayer in the five years before making the gift received by gift, bequest, devise or inheritance or which he acquired in exchange for such gift, if the property when received as a gift was subjected to estate or gift tax.

Exemptions Allowed

Non-resident aliens.

Same as for citizens except the $50,000 exemption is not allowed.

Credits

Credit against estate tax of a donor is provided for amount paid upon any gift which is to be included in his estate.—Section 322.

Returns

To be filed on or before March 15.—Section 323.

Estate Tax

If no executor or administrator appointed and acting within the United States, then "executor" means any person in actual constructive possession of any property of the decedent.

Rates of tax from 1 per cent on net estate not over $50,000 to 40 per cent on estate in excess of $10,000,000.

No exemption for estates of persons dying from injuries incurred or dis-

eases contracted during or in military or naval pursuits as in 1921.—Section 300 (a).

Credit against estate tax shall be allowed for estate or inheritance, etc., taxes paid to any state, territory or the District of Columbia on any property included in the gross estate, such credit not to exceed 25 per cent of the tax imposed by this section.—Section 300 (b).

Gross estate includes all property to the extent therein of which the decedent has at any time made a transfer or with respect to which he has at any time created a trust where he could have at his dealth altered, amended or revoked the transfer or trust or where he relinquished such power in contemplation of death except in case of a bona fide sale.—Section 302 (d).

The commissioner may extend time for payment of estate taxes five years instead of three—made retroactive to 1921.—Section 305 (b).

Appeals to Board of Tax Appeals must be made within sixty days.—Section 308 (a).

Where tax shown by executor not paid when due, interest runs at 1 per cent a month.—Section 309 (a) (1).

Miscellaneous—Admissions

Takes effect thirty days after enactment of the act.

No tax on admission less than fifty cents.—Section 500 (a) (1).

Law does not carry 5 per cent penalty for failure to pay.

Where admission to cabaret, roof garden or other similar entertainment is 50 cents or less there is no tax.—Section 500 (a) (5).

To admissions not taxable are added national guard organizations, reserve officers organizations, posts or organizations of war veterans or auxiliary units of any such posts or organizations.—Section 500 (b).

Auto Taxes

Effective thirty days after the enactment of this act.

No tax on automobile truck or wagon chassis costing less than $1000. If over $1000, 3 per cent.—Section 600 (1).

No tax on automobile truck bodies or automobile wagon bodies (including parts or accessories thereof sold with or in connection therewith) costing less than $200. If over $200, 3 per cent.

Sale of trucks or wagons shall be considered a sale of the chassis and of the bodies.

Tires and inner tubes, parts or accessories sold to any person other than a manufacturer or producer of automobile truck or wagon chassis or bodies or other automobile chassis or bodies or motorcycles subject to 2½ per cent.—Section 600 (3).

Brokers Tax

$50 tax does not apply to brokers exclusively negotiating purchases and sales of produce or merchandise.

Other brokers who are members of stock or produce exchanges pay an additional tax based on the value of the seat whether they pay the $50 or not.—Section 701 (1).

Capital Stock Tax

No change from 1921 law.

Dues or Membership Fees Tax

Dues paid to a local fraternal organization among the students of a college or university are exempt.—Section 501.

Jewelry Tax

Does not apply to any article costing less than $30.

New exemptions—Surgical instruments, musical instruments, eye-glasses, spectacles, silver-plated flat table-ware, or articles used for religious purposes. Does not apply to watches sold or leased for less than $60.—Section 604.

Occupation Tax

In case of automobiles used in carrying school children to and from school the $10 tax does not apply.—Section 701 (8).

Stamp Taxes

Tax does not apply in case of stocks and bonds issued by domestic building and loan associations *substantially all* of the business of which is confined to making loans to members.

Rates on sales of produce on exchanges reduced from 2 cents to 1 cent per $100 or fraction thereof.

Stamp tax on playing cards raised from eight cents to ten cents.—Section 800.

General Miscellaneous Taxes

Mah-Jong, pung chow, and parts thereof, 10 per cent.

X-ray films and plates exempt from the 5 per cent tav.—Section 600 (5).

Tax and Penalties Repealed on

Carpets, rugs, trunks, valises, purses, lamps, fans, etc., candy, Cereal beverages and soft drinks, circus, dirk knives, dues or membership fees, *penalty* of 5 per cent for failure to pay tax, hunting and bowie knives, jewelry tax 5 per cent *penalty* for failure to pay, liveries, livery boots and hats, riding habits, hunting garments, motion picture film tax on leases from one affiliated corporation to another, smoking stands, stamp tax on drafts, checks and promissory notes, telephone and telegraph message tax, yachts, motor boats and canoes, $15 tax on public exhibitions not specifically described, 5 per cent penalty for failure to pay excise taxes.

Lower Coast Rates

Commission Authorizes Reduction by Water from New York

Washington, June 24.—A decision authorizing the Southern Pacific railroad to reduce freight rates on numerous commodities in carload lots from its New York piers, routed partly by rail and partly by water, to points in New Mexico, Arizona and California is announced by the interstate commerce commission. The schedules will reduce rates on machinery thus shipped, from $2.88 to $2.28; iron castings and forgings, from $1.65 to $1.20; wire nails, from $1.65 to $1; automobile pressed steel sides, from $1.73 to to $1.25; iron flooring, from $1.87½ to $1.25; wire cloth, from $2.25 to $1.60, and tin plate from $1.20 to 75 cents per 100 pounds. Other commodities are reduced similarly, 115 tariff items being affected by the change. The schedules had been opposed by the Chicago Association of Commerce, the Chicago Shippers' Conference association, the Western Pacific line, the Sante Fe railroad and others. Protestants held that the proposed rates were unduly prejudicial to Chicago and the territory served by it, and unduly preferential to New York.

The lower charges were necessary, as provided in the proposed schedules, the Southern Pacific argued because of increased competition of the Panama canal. The road first gave notice of its intention to prescribe the reduced rates on what is known as the Sunset route, the shipments to go by water to Galveston and New Orleans and thence by rail to Pacific points.

"Since the return of ships to the Panama canal routes subsequent to the world war," the commission said in its order, "traffic which is susceptible of water, carriage has been moving from the Atlantic seaboard to the Pacific coast over this route in large volume, and the low rates offered have attracted traffic from points several hundred miles back in the interior."

After quoting section 500 of the transportation act, in which congress declared its policy to be one of promoting, encouraging and developing water transportation and to foster and preserve in full vigor both rail and water transportation, the commission said:

"The policy of the congress in this respect can be effected only under rate adjustments which will permit of an equitable distribution of the available traffic. As previously indicated the present rate adjustments are such that the canal lines secure practically all of the traffic not requiring expedited service, in commodities susceptible of water transportation, now moving from New York and vicinity to California ports and to considerable interior territory. The rate adjustment here proposed appears to be a step in the direction of securing, as between the water carriers, a more equitable distribution of the available traffic, and as such its tendency will be toward attaining the ends designed by the law."

To Celebrate Centenary

The Franklin institute, Philadelphia, is issuing invitations to the celebration of the centenary of the founding of the institute. The exercises will be held Sept. 17-19. The act incorporating the "Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanical Arts," was signed by the governor of Pennsylvania on March 30, 1824. The centenary will be observed in memory and in recognition of those who have devoted their efforts during the past 100 years to the discovery of physical laws and their applications.

IRON TRADE REVIEW
Registered U. S. Patent Office
The Authority of Industry National and International

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Published Every Thursday by
THE PENTON PUBLISHING CO., CLEVELAND, O.

Member, Audit Bureau of Circulation, Associated Business Papers, Inc., and National Publishers Association

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Cable Address IROTRAPEN, London, IROTRAPRI, Paris

Subscription, United States, Cuba and Mexico, $6 per year. Canada, $8.50 per year. Great Britain and other countries, £2:0:0 per year

Entered at the Postoffice at Cleveland as Second Class Matter
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Selling Needs Executive Study

IN HIS recent address on "Selling Methods in the Steel Industry," Ernest T. Weir, president of the Weirton Steel Co., told the members of the American Iron and Steel institute that the steel company executives generally are men with a love of production and plant development. He expressed his belief that the steel executives, as a rule, devote more time and thought and personal interest to the question of manufacturing than they do to the problem of merchandising the product of the mills.

As has been shown time and again preference in promotion to the post of executive head of a steel company almost always goes to the man who has come up on the operating side. This preference is entirely logical. It develops from the fact that the costs and other factors involved in the production of steel are overwhelmingly the preponderant considerations in the steel business. In a remarkable survey of the buying habits of industry, the McGraw-Hill Co., New York, has determined that 82 per cent of the selling price of steel is comprised of the costs of material and labor. It is because the selling expense is comparatively a small percentage of the selling price that the problems of production are of chief importance. This survey found that in manufacturing industries which sell to the public at large, and in which the problems of selling are much more intricate, the executives graduate from the sales department. In the collar and cuff industry, for instance, where the cost of labor and materials is only 55 per cent of the selling price and where the cost of selling is great, a majority of the company heads are salesmen rather than production men.

That production problems receive the chief attention of the steel executives is readily revealed by looking over the proceedings of the meetings of the American Iron and Steel institute. These meetings primarily are designed to serve the executives in the industry. Papers on selling methods, such as that by Mr. Weir, have been exceedingly few in number. That there is a big demand for literature of this kind was clearly shown by the fact that the supply of copies of Mr. Weir's paper at the institute meeting was exhausted long before those dealing with operating problems showed any signs of being depleted.

Mr. Weir's paper contained pertinent suggestions as to how the selling methods in the steel industry may be improved. His most important suggestion, however, was that executives should personally oversee and control their sales departments. There is no disputing that questions involved in selling methods are among the most important confronting the steel industry at this time. This promises to become even more-so in the future. If Mr. Weir's suggestion is followed, and the exectives give to the department of selling the thought and attention it deserves, the results are bound to prove beneficial to the entire industry.

Sound Business Benefits All

HIGH ground as to the right code for business is taken by Antioch college, Yellow Springs, O., an institution that has been making unique progress by combining practical employment with class-room theory in the training of its students.

"Sound business is service which benefits all the parties concerned. To take profit without contributing to essential welfare; to take excessive profit; to cater to ignorance, credulity or human frailty; to debase taste or standards for profits; to use methods not inspired by good will and fair dealing; this is dishonor. Whenever I make or sell a product or render a business service, it must be my best possible contribution to human well-being."

Thus reads the code. At Antioch business is looked upon as one of the great professions. Realizing that every failure in business by a person of fine ideals strengthens the notion that business and ideals are incompatible, the college is seeking to give its students a practical business training into which to fit the high standards of ethics that are implanted by the course of instruction. Stu-

dents spend half their time in study and half in actual business positions, in periods of five weeks, thus gaining experience from contact with the realities of the commercial world which in turn are illuminative of the more theoretical and scholastic school work.

It is a hopeful sign of the times that education is concerning itself not only with the molding of the youth of the land for useful accomplishment but as a means for lifting the plane of business honesty and of strengthening its better elements.

In presenting its claims Antioch college says: "Repeatedly men are torn between the desire to live by the finest ideals and the necessity for meeting practical issues in a practical manner. He is an educated man who, through experiencing this stress, has learned to harmonize such conflicting demands." Those two sentences constitute a strong business sermon.

Dollar Wins World Supremacy

ONE of the economic results of the war has been the steady shifting of the world's financial center of gravity from London to New York. This process has been made possible by America's great creditor position and by the concentration of one-half of the world's monetary gold stocks within her borders. That the dollar has finally come into undisputed supremacy is evidenced by two recent events.

One of them is the decline of discount rates in this country to the lowest levels of any nation anywhere. The other is the decision of Germany to tie the new proposed "gold bank" to the dollar instead of to the pound sterling. The Dawes plan calls for a gold bank of issue for Germany but leaves the door open for the adoption of sterling as the standard of exchange.

The dollar has been chosen as the measure of value for the German bank by virtue of the fact that it is the only important currency interchangeable with gold. During the deliberations of the Dawes committee France and England opposed an immediate gold basis for Germany, in view of their own paper currencies.

American bankers, however, have insisted that the dollar, and none other, form the standard of exchange for the new gold bank, when organized. This was set forth as one of the conditions necessary before American investors could be induced to engage in European ventures.

The gold basis for Germany is important for this country in a number of ways. It is a victory for the gold standard upon which values in the United States are based. It points the way for a return to the gold standard and stable finance in Europe, sidetracking all possibility of a definite abandonment of gold as the world's measure of value. Moreover, the prospect of a successful agreement upon the Dawes plan, together with the gold basis for Germany opens the way for American participation in European rehabilitation.

Europe must borrow American credit and buy American food, raw materials and goods. Here only the things she needs are available in abundance. This outlook daily growing more definite is one of the most tangible forces which may bring a bigger and broader recovery of business this year than many people now think probable.

Order Volume Less Important

IN PROPORTION to production, orders for steel at present are probably the lowest in history. The abnormally shrunken size of order books when considered alongside the rate of mill operations has been one of the striking peculiarities of the market during the past year and this fact has been pointed out at various times. The sharp slump of business during the past 60 or 90 days has served to distend this unusual relationship of orders and production.

The extreme of the present situation can be perceived definitely from the unfilled tonnage account of the Steel corporation. At the end of May the total volume of unfilled business on hand with the leading producer was at the lowest point since November, 1914. The tonnage even was 12 per cent below the bottom figure touched in 1921. Both of these comparisons are against times of about as severe a depression as the steel industry has ever experienced. In 1921 without question the industry was never so thoroughly prostrated. It requires no overdrawn imagination or optimism to realize the vast difference between fundamental conditions today and those of three or 10 years previously. The present situation is infinitely sounder and stronger in all elementary factors.

Unfilled orders, therefore, today do not possess their usual significance as a measure of trade conditions. Perhaps with productive capacity so large, delivery service by the railroads so efficient and buyers opposed to liberal inventories because of bitter recent experiences, this factor no longer can be expected to reflect the volume of demand in the same way as in the past. At any rate, too many people have allowed the size of their order books to color their business opinion rather than to look at what might lie behind them. Probably this has given rise to the statement that business is better than business sentiment. Without discounting the certain unfavorable things about the present situation, it is not saying too much that a lot of people apparently have allowed themselves to suffer from a plain case of nerves.

Current Statistics of Industry

Auto Production Shows Decline in May

Washington, June 24.—The production of automobiles in May as reported by 205 manufacturers to the department of commerce was 312,813. This was a decline of 16 per cent from April. Compared with the peak month for all time, May, 1923, there was a loss of 20 per cent. Except for last year the production of cars in May was the largest for that month in history. In May the number of passenger cars produced was 279,439, a decrease of 17 per cent from the April total. Truck output of 33,374 dropped 7 per cent from that for April. The production of passenger cars and trucks in five months was 1,752,156 cars a gain of 102,000 cars over the corresponding period of 1923.

The monthly record of passenger car and truck production follows:

Passenger Cars

	1922	1923	1924
January	81,696	223,822	*287,353
February	109,171	254,782	*336,374
March	152,962	319,789	*348,356
April	197,224	344,661	*337,045
May	232,462	350,460	279,439
June	263,053	*337,442	.....
July	225,103	*297,413	.....
August	242,498	*314,431	.....
September	187,711	*298,964	.....
October	217,582	*335,041	.....
November	215,362	*284,939	.....
December	208,016	*275,472	.....

*Revised.

Trucks

	1922	1923	1924
January	9,596	19,732	28,922
February	13,360	22,173	31,151
March	20,036	35,284	*34,109
April	22,665	38,085	*36,154
May	24,120	43,730	33,374
June	26,354	41,173	.....
July	22,083	30,692	.....
August	24,711	30,872	.....
September	19,495	28,578	.....
October	21,824	30,139	.....
November	21,967	28,073	.....
December	20,394	27,762	.....

Stoker Bookings Drop

Washington, June 24.—May sales of mechanical stokers, totaling 64 registered a sharp drop from the total of 89 in April and 110 in February. Of the May total only three were for installation under fire tube boilers as compared with 15 in April. Following is a comparison for 1923 and the first five months of 1924:

1924	Stokers sold	Fire tube boilers	Water tube boilers
January	91	7	84
February	110	11	99
March	89	12	77
April	89	15	74
May	64	3	61
1923			
January	145	29	116
February	129	9	120
March	120	9	111
April	167	14	153
May	194	14	180
June	135	6	129
July	129	21	108
August	135	18	117
September	99	16	83
October	88	14	74
November	50	10	40
December	73	17	56
Total 1923	1,464	177	1,287

Enameled Ware Sales Low

Washington, June 24.—Sales of enameled sanitary ware in May were lower than in preceding months, according to figures compiled for the first time by the department of commerce on the production, shipments, unfilled orders, etc., of that industry. Unfilled orders on May 31, were 549,450 pieces of small ware and 214,309 baths as compared with 689,086 pieces of small ware and 239,118 baths on April 30, and 1,066,772 pieces and 296,497 baths on May 31, 1923. Following is a comparison of the figures recently compiled:

	Unfilled Orders—Small Ware		Unfilled Orders—Baths	
	1924	1923	1924	1923
January	704,194	829,235	216,295	250,369
February	756,311	997,126	235,279	301,911
March	774,831	1,056,942	245,921	310,740
April	689,086	1,100,340	239,118	318,329
May	549,450	1,066,772	214,309	296,497

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Beehive Coke Output Gain Fails To Continue

Washington, June 24.—The silght recovery in beehive coke production during the first week in June was not sustained in the second week, according to the geological survey. The total output dropped back to 131,000 tons, according to estimates based on reports of cars of coke loaded for shipment by the principal carriers. This was approximately one-third the quantity produced in the week ended June 16, 1923, but is well above the average level of production during the depression of 1921 and the strike of 1922. The record of production by districts follows:

	—Week ended— June 14, 1924a	June 7, 1924b	June 16, 1923
Pennsylvania and Ohio	93,000	110,000	332,000
West Virginia	6,000	7,000	20,000
Alabama, Kentucky, Tennessee and Georgia	17,000	19,000	24,000
Virginia	6,000	6,000	15,000
Colorado and New Mexico	5,000	5,000	8,000
Washington and Utah	4,000	3,000	7,000
United States Total	131,000	150,000	406,000
Daily average	22,000	25,000	68,000

(a) Subject to revision. (b) Revised from last report.

The recent spurt of soft coal production has subsided. In the second week of June the output was 6,999,000 tons against 7,373,000 tons one week before.

Furniture Shipments Drop

Washington, June 24.—Another drop in steel furniture shipments was registered in May, the value of products shipped being $1,505,367, as compared with $1,658,610, in April and $1,661,303 in March, according to figures of the department of commerce, based on returns from 22 manufacturers. The following figures give a comparison of shipments since January 1922:

	1922	1923	1924
January	$983,834	$1,362,470	$1,592,338
February	967,125	1,307,173	1,605,409
March	1,087,228	1,709,206	1,661,303
April	1,058,382	1,520,286	1,658,610
May	1,056,735	1,506,072	1,505,367
June	1,015,463	1,401,950	.....
July	945,768	1,247,605	.....
August	943,087	1,345,147	.....
September	1,062,495	1,273,259	.....
October	1,227,447	1,365,600	.....
November	1,204,310	1,339,425	.....
December	1,376,152	1,455,836	.....

Edward P. Morse Jr., and Frank J. McConnell have been appointed receivers in equity of the National Drydock & Repair Co., Inc., 80 Broad street, New York, with plant at West Brighton, Staten Island.

The Business Trend

June 26, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

THE extreme cheapness of credit is a dominating feature of the present situation. It has stimulated the bond market and helped to lift share values. Business, however, remains impervious to the spur of it.

Fears of a "gold inflation" find little support in industry's persistent failure to respond to overflowing credit supplies. The truth is that easy money is only one factor in business calculations looking to recovery.

Superabundant credit has resulted from enormous imports of gold. It has been accentuated by trade dullness. Money stringency had nothing to do with checking business. Easy money will not aid business until other conditions are favorable.

First, production and consumption must be in healthy relationship. Fortunately this is being brought about by deep cuts in outputs. The result is that flashes of confidence have appeared in spots and a generally less somber sentiment is developing.

Watching for Turn

Business is watching anxiously for signs of a turn. In pig iron, in silk and a few lines indications are favorable. Shares give some hope also. There is evidence that reaction is near bottom, but the quiet summer months probably will intervene before substantial recovery is to be expected.

Once recovery begins it will receive impetus from abundant credit. Meanwhile, the plethora of banking resources erases the danger from "frozen loans" and "distress inventories" so prevalent in 1920. That should soften the blow of reaction and help shorten its duration.

One of the most constructive of domestic events has been the strength of grain prices. Wheat advanced to the highest price in a year. Corn rose to the best level since 1920. This is helping narrow the gap between rural and urban prices and to improve farmer sentiment.

Balance Being Restored

Low prices for the things the farmer sells and relatively high ones for the things he buys have constituted a serious defect in the economic situation. Falling industrial prices are helping restore a healthy balance and provide a basis for real prosperity.

One significant result of the American credit situation is the unmistakable shifting of the world's financial center from London to New York. Rediscount rates here are the lowest in the world. Moreover Germany has decided on the gold basis for its new bank.

This decision means that the dollar will be standard of exchange for the financing under the Dawes plan. The dollar is the only important western currency on a parity with gold. Germany's action points the way for a return to a stable currency in Europe.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business Failures ..	409	391	387	313	...
Cash ratio Fed. Res. System %	82.1	82.4	83.7	77.6	...
Loan rate. 4-6 mos. N. Y. %	3¾-4	4	4-4¼	5	6
Aver. 25 industrial shares	$110.60	$109.32	$105.51	$107.10	$58.19
Aver. 25 railroad shares	$65.35	$65.60	$62.45	$63.52	$82.91
Aver. 40 bonds..	$80.35	$80.46	$78.65	$77.60	$93.00
Car loadings, week ended June 7..	910,907	819,904	909,187	1,013,249	*930,970
Bank debits, 246 cities (000 omitted) *1920	$10,810,985	$9,357,848	$9,970,240	$10,339,593	.....

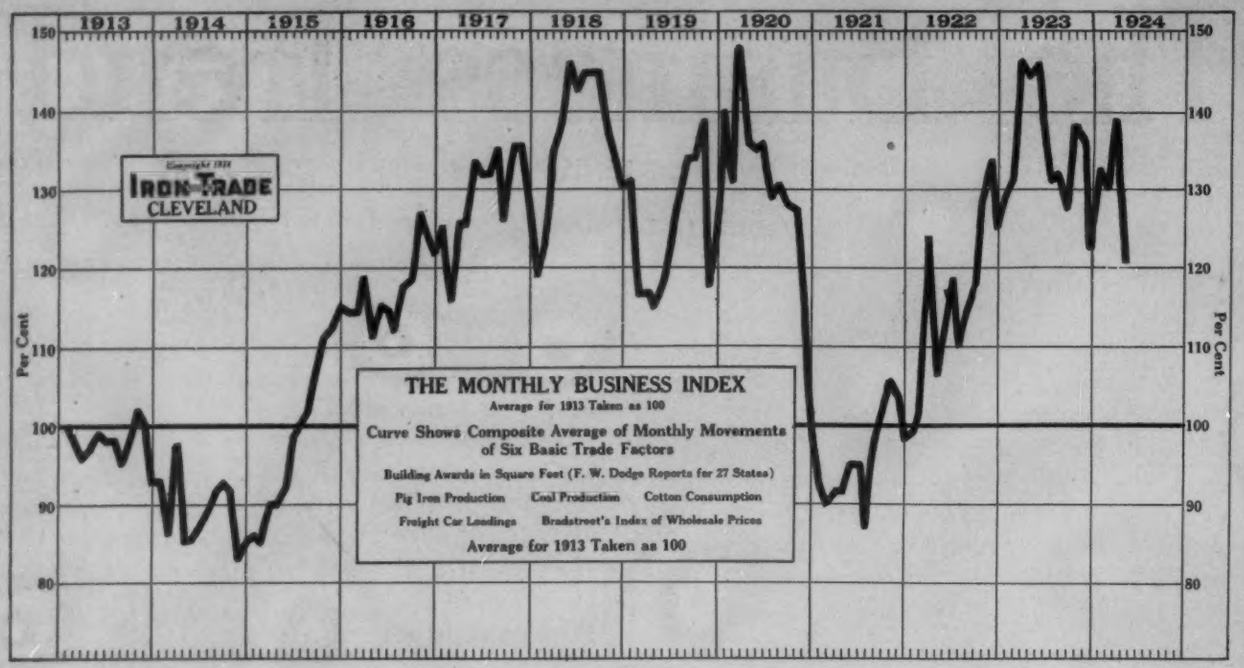
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.33	$4.31	$4.36	$4.61
Francs	19.3c	5.41c	5.38c	5.72c	6.19c
Lira	19.3c	4.32c	4.34c	4.44c	4.49c

Monthly Comparison

Dodge Building awards in 27 states (sq. ft.)	May 57,708,800	One Month before 63,347,400	One Year ago 60,844,300	1913 Mo. average 31,250,000
Business failures: Number	1,816	1,707	1,530	1,336
Liabilities ..	$36,590,907	$48,904,452	$41,022,277	$22,732,000
Exports	$336,000,000	$348,000,000	$316,359,000	$233,195,000
Excess of gold imports	$40,480,000	$44,027,000	$45,331,751	†$630,716
Bureau of labor price index ..	147	148	156	100
Bradstreet's price index	133	135.8	144.8	100
Economist's British price index	166.6	170.6	161.5	100
Nat'l Industrial Con. board living cost index	161.4	161.8	160.3	‡100
New incorporations	$519,897,000	$528,900,000	$817,230,000	$49,301,000
Railroad net earnings	*$61,821,900	$80,239,885	$83,515,300	$59,301,000

†Excess of gold exports. ‡July, 1914. *April.

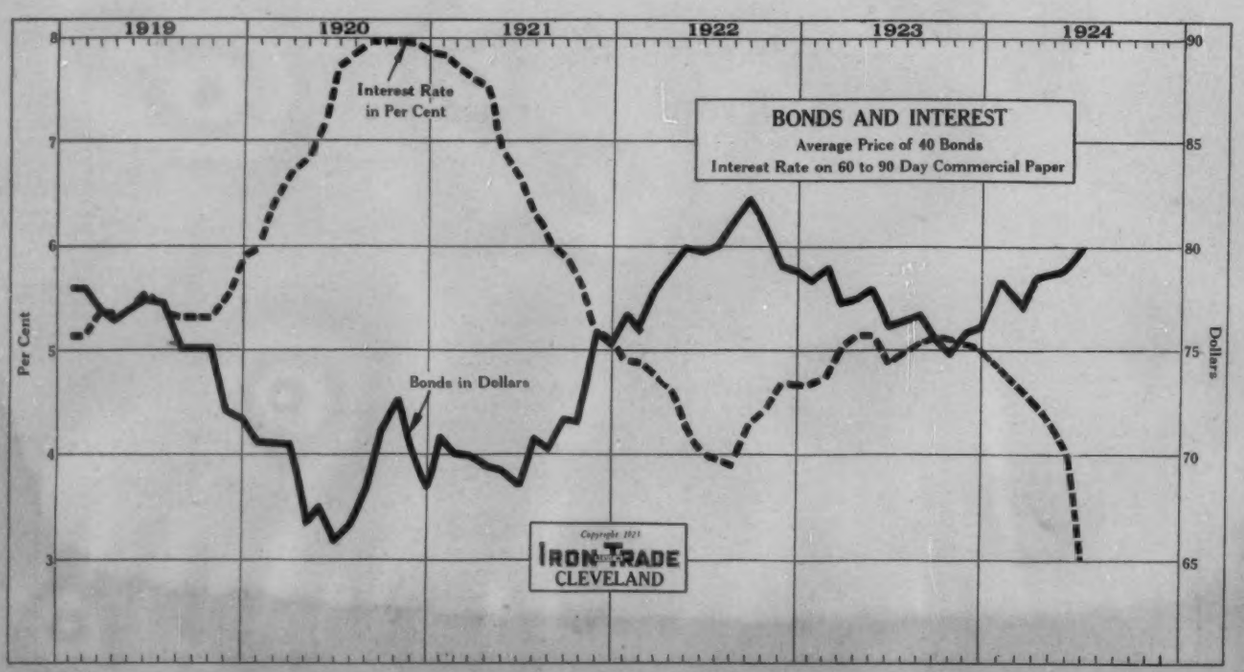


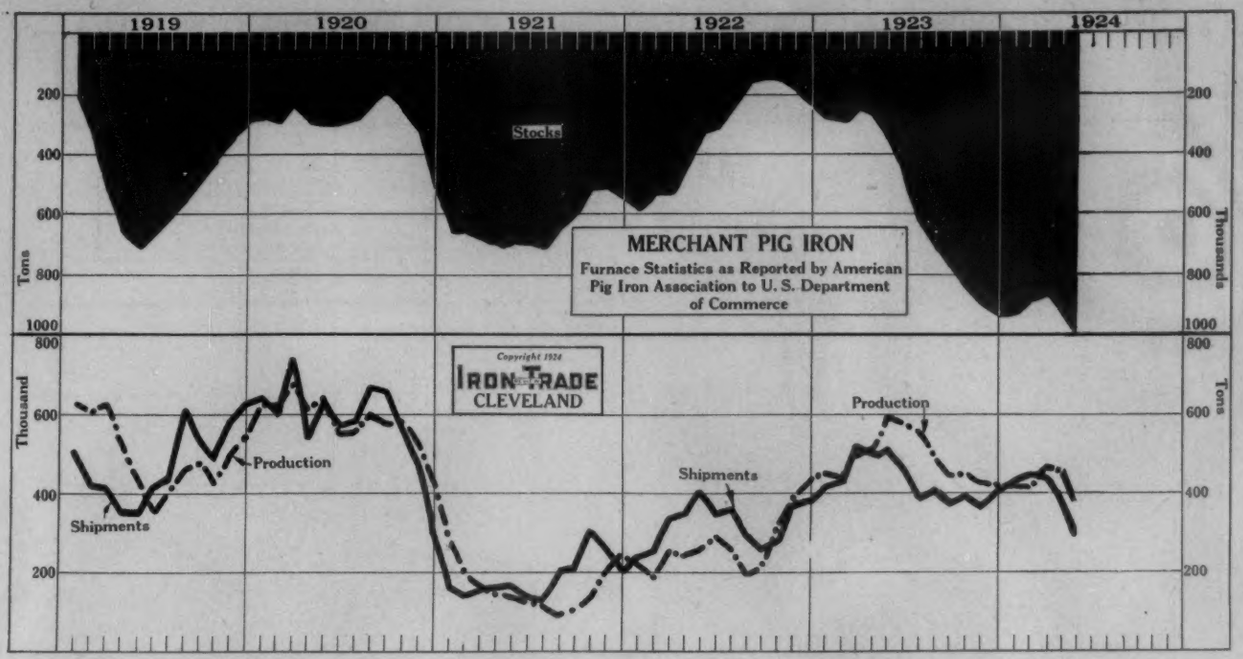
Business Index

THE decline in general business activities is faithfully pictured in the IRON TRADE REVIEW Monthly Business Index. In May the index stood at 121 compared with 129 in April and 139 in March, the peak of the year. In May of 1923 the index touched the peak at 146. The index is in percentages of 1913 as 100. Last month's declines were recorded in four of the factors comprising the Index, pig iron output, cotton, consumption prices and building. Car loadings and coal production showed gains over April.

Bonds and Interest

ONE of the most significant developments of the year has been the wide drop in the cost of credit. Interest rates have declined to the lowest levels since 1908, in some instances. Open market rates for commercial paper are as low as 3 per cent. Rediscount rates of the federal reserve banks have been cut, in two cases to 3½ per cent the lowest in their history save a wartime expedient in 1917. Cheap money reflects trade slackening and big gold imports. One result has been the rise of bonds to the highest point since 1922.



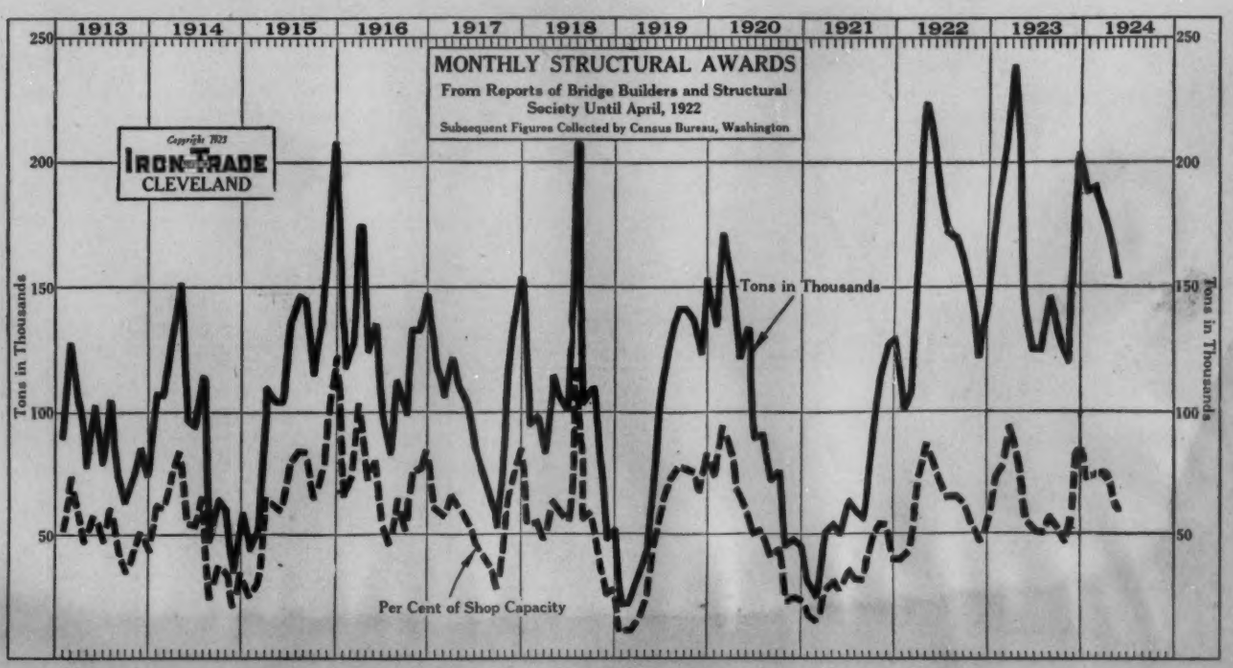


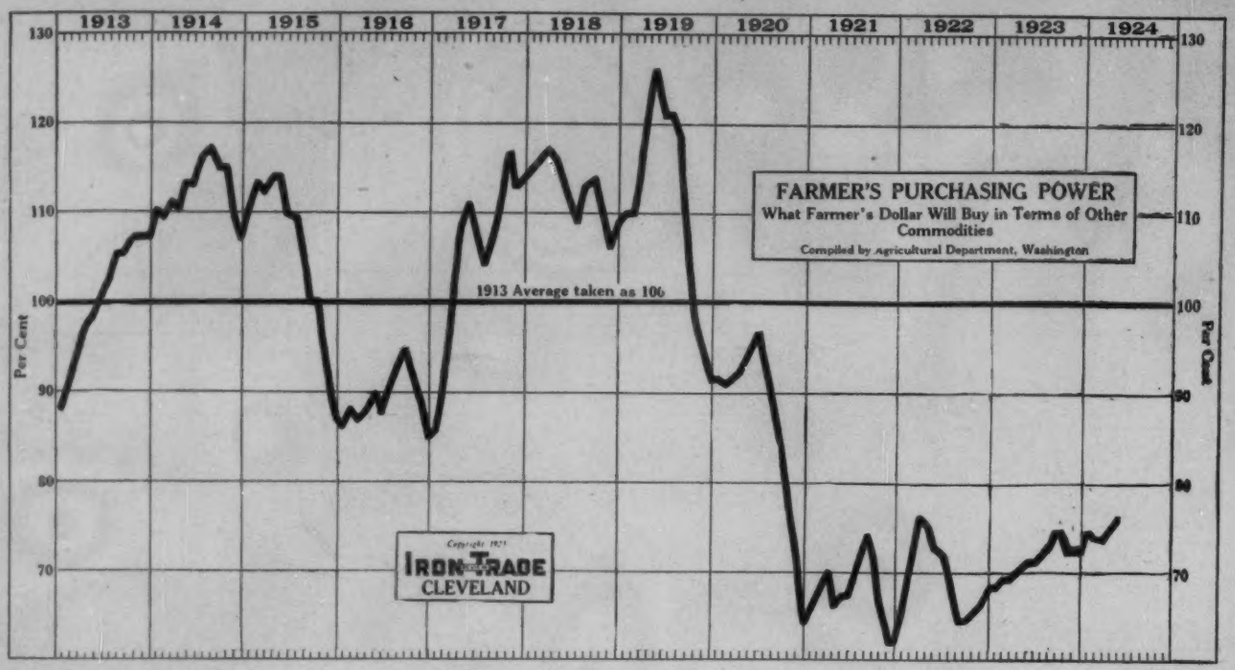
Merchant Pig Iron

THE huge overhanging burden of stocks on hand at merchant furnaces has helped to weight down pig iron prices to a lower level. With quotations at below production costs buyers have been attracted and substantial sales resulted in June. Stocks in May, as depicted by the diagram exceeded 1,000,000 tons, the highest ever recorded for the furnaces of the American Pig Iron association. Production in May declined 12 per cent from the April total to 396,204 tons while sales increased 68 per cent to 165,193 tons.

Structural Steel

ONE of the strongest factors in the steel market has been that of structural steel. The recession in structural sales and outputs has been only moderate. In May bookings of shapes were estimated at 153,400 tons in the country. This was a decline of 9 per cent from the April total and of 19 per cent from the year's peak in February. Compared with May 1923 a gain of 3 per cent is shown. The per cent of shop capacity represented by May bookings was 59 per cent against 57 per cent one year ago.



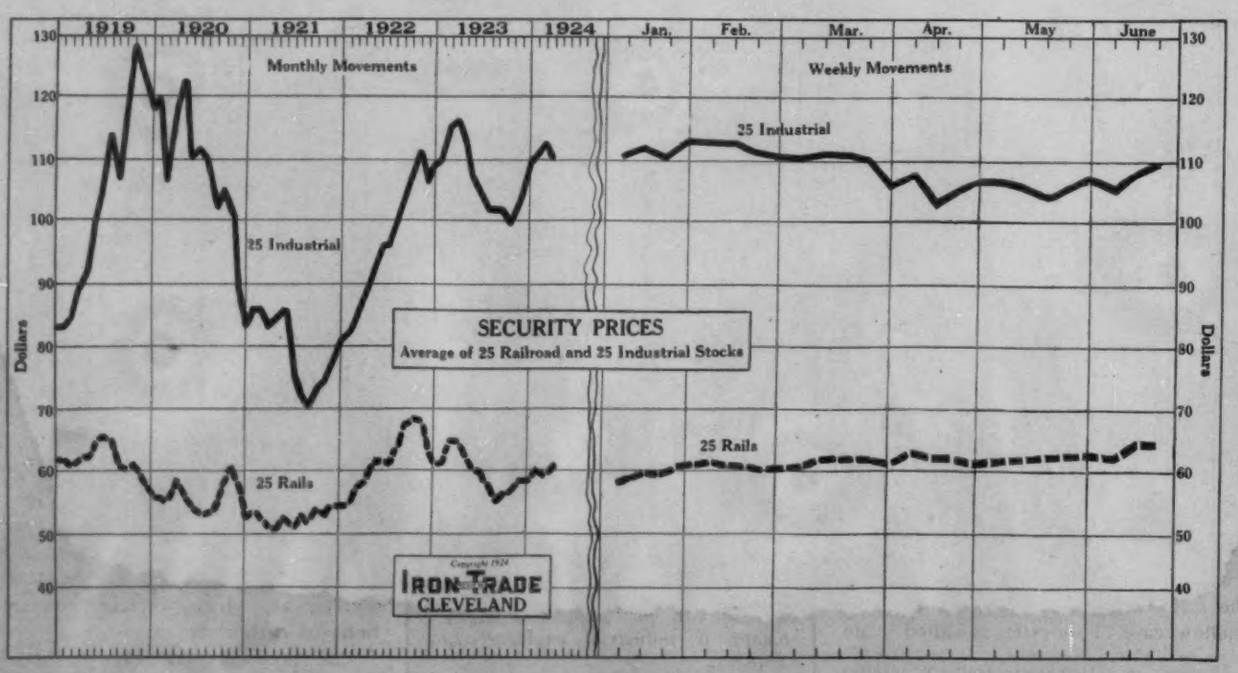


Farmers' Purchasing Power

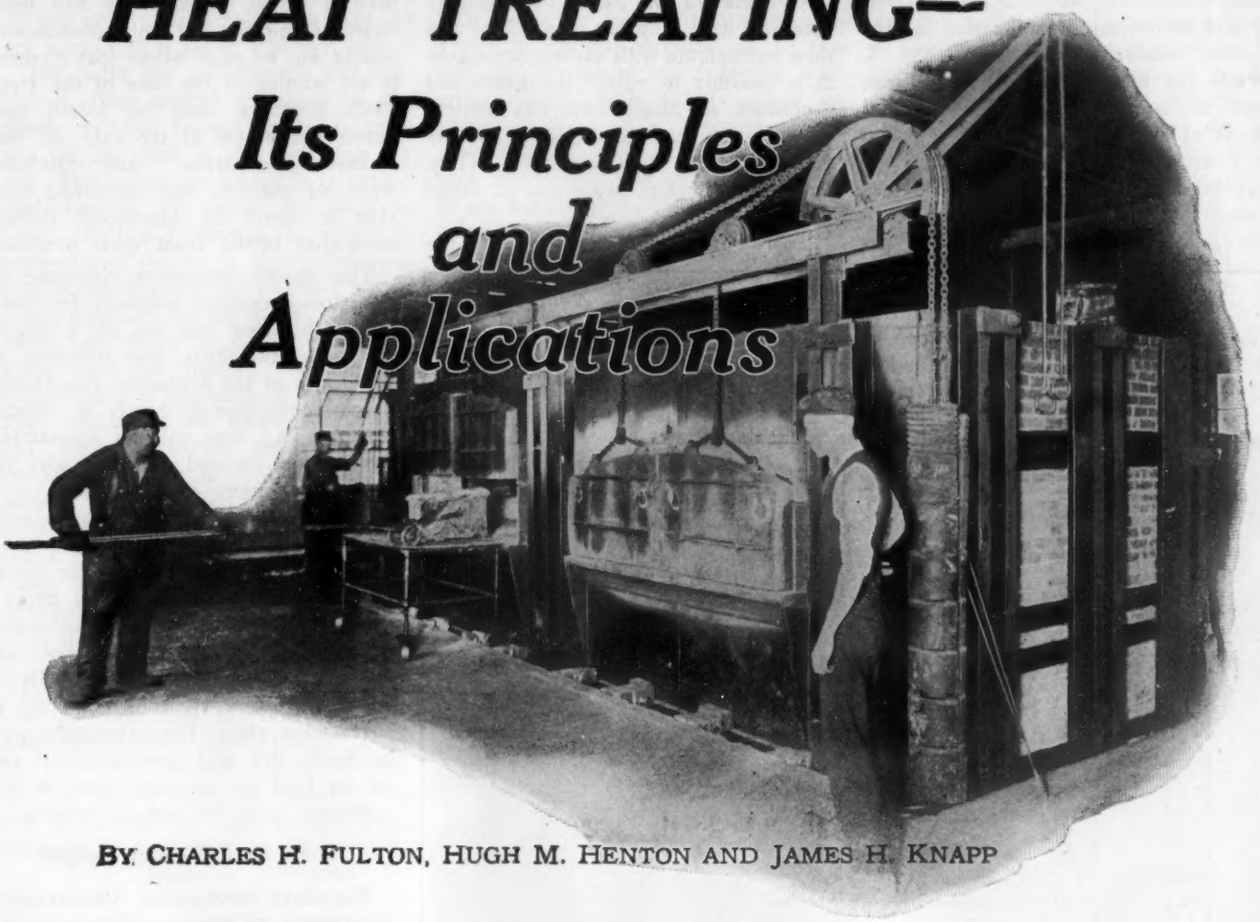
THE government's report of the worst crop outlook in a dozen years touched off the most spectacular advance of grain prices in a year. This has helped to improve agricultural sentiment. The purchasing power of farm products in terms of other commodities now stands at the highest point in four years. In May it was 77 per cent of the 1913 level, compared with 76 per cent in April and 71 per cent in May 1923. The general tendency of the farmer's position has been distinctly upward since 1922.

Security Prices

FOLLOWING extended inactivity, share markets recently developed strength. The average for 25 industrial shares gained about six points from the low level of the year to very near the top record for 1924. Twenty-five railroad shares have fared better than industrials with a gain of five points to the highest level since early 1923. Low money rates, tax reduction, adjournment of congress were factors in the rise. Whether or not a real advance is under way as a forerunner of trade improvement remains to be seen.



HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter VII—Carburizing and Case Hardening—Continued

CARBURIZING boxes should be of ample size to give a clearance of at least 1 inch to the pieces when packed. The work is packed so as not to touch anything but the carburizing compound. Gears with large open centers sometimes are packed in special boxes of annular form. In some cases a small recess is provided in the corner of the box to accommodate a test piece. Small legs on the bottom keep the box from contact with the hearth of the furnace. Grooves at the side are made to fit a special pair of tongs for entering and removing the box. The partly spent compound is dumped out upon a screen after the pots cool, so the pieces of work can be quickly picked out. The screen also serves to sort out pieces of fire clay from the carburizing compound.

The liquid cements used are chiefly potassium cyanide, ferrocyanide, and mixtures of these with other more or less inert substances, liquid at a temperature of 700 degrees Cent. (1292)*. They give a vigorous carburization on the extreme outside, but also a very shallow case. This often is called "skin hardening." Articles cannot be left long in cyanide pots or they will be much corroded rather than carburized. Often the solid material is sprinkled on a tool and melts when the tool is heated in reducing flame, giving the skin hardening desired. Considerable variation in colors for artistic designs can be effected by combinations of liquid cements, electroplating, and temper color.

The cyanide pots have an advantage over solid cement boxes in that they are capable of much more even heating as ordinarily used, and the melted condition of the cyanide gives a good idea of temperature. We are more certain that the pyrometer, immersed, is giving the true temperature of the bath. Cold spots are indicated by cyanide solidifying or forming a crust.

Carburizing, in all cements, depends for its action upon the gases evolved, but there is a class of work like armor plate, which uses gases. The plate, in sheets, is placed so that one side only is heated to about 1000 degrees Cent. (1832) and ethylene, methane and carbon monoxide gases are passed over the surface. Certain combinations of the three give better results than any one gas alone. Fig. 66 from "Cementation of Iron and Steel" by Giolitti, gives the depth in milimeters at which certain concentrations of carbon are found.

The three curves in Fig. 66 show the depth of concentration for each of the

*Figures in parentheses represent degrees Fahrenheit.

Carburizing Procedure Is Outlined

THE technic of carburizing is discussed in this the third installment of Chapter VII. Chapter I of the series appeared Oct. 4; Chapter II was published in the issues of Oct. 18, Nov. 1 and Nov. 15; Chapter III in the issues of Nov. 29, Dec. 13 and Dec. 27; and Chapter IV in the issue of Jan. 10. Chapter V appeared in the Jan. 24, Feb. 7, Feb. 21, March 6 and March 20 issues. Chapter VI appeared April 3, April 17, May 1 and May 15. Chapter VII appeared May 29 and June 12.

Charles H. Fulton is director of school of mines and metallurgy, University of Missouri; Hugh M. Henton is consulting metallurgical engineer and assistant professor of metallurgy and mining, State College of Washington, and James H. Knapp is industrial engineer, Los Angeles.

three gases at its best temperature and time. Comparing, we note the regularity and uniformity of graduation for the carbon monoxide in curve No. 3. While the highest carbon at the outside is only 0.34 per cent, yet it drops at an even rate to 0.1 per cent at 3 millimeters depth of case. Ethylene gas in curve No. 2 gives the highest carbon at the outside. (1.32 per cent), but grades rapidly down to 0.05 per cent carbon at 2.3 millimeters depth. It is not nearly as even in rate of decrease. Methane gas, in curve No 1 gives a concentration of 1.28 per cent carbon on the outside and does not drop to low carbon as rapidly as ethylene, but is uneven in rate.

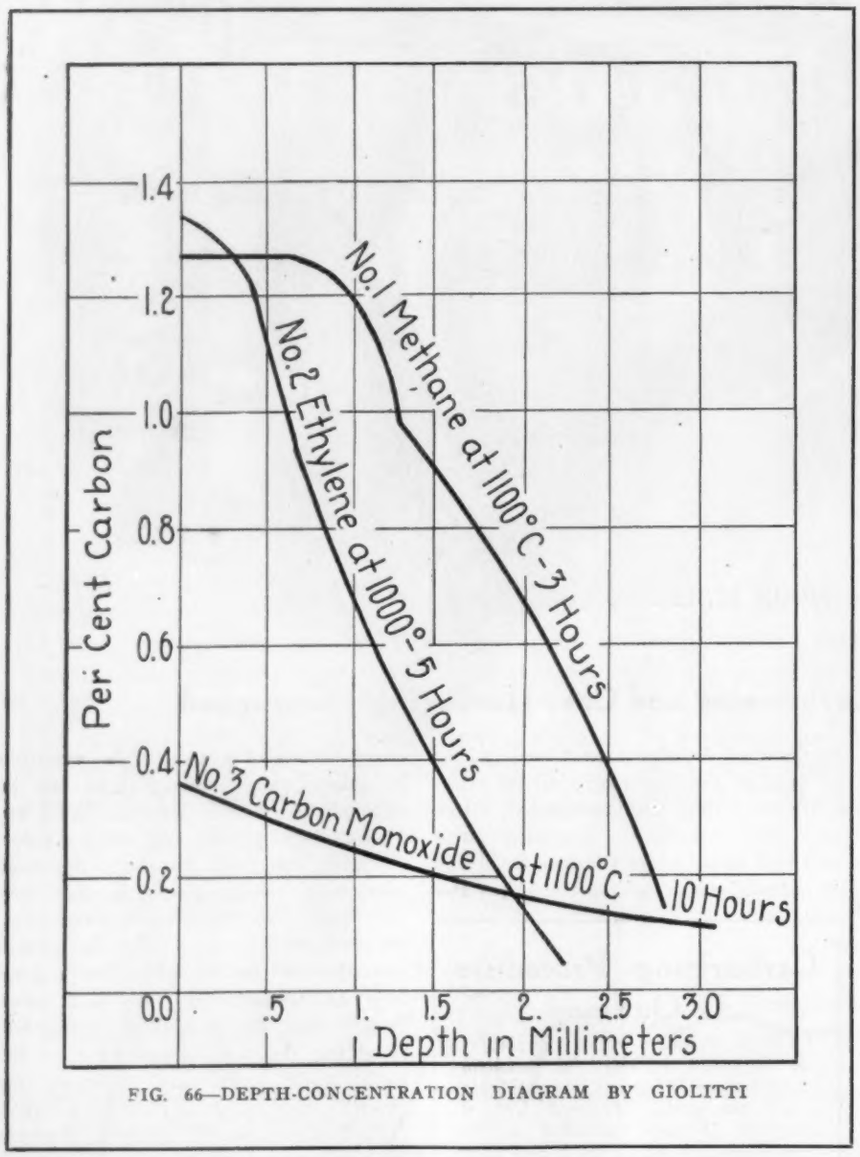


FIG. 66—DEPTH-CONCENTRATION DIAGRAM BY GIOLITTI

A case like No. 1 will be so foliated as to be sure to crack by zones on quenching. One like No. 2 will have a shallow zone of high carbon on the outside which will be quite sure to crack loose. A case like No 3 will be too low in carbon to be effective for most wearing surfaces. The solution of the problem is twofold. We may effect a combination of gases or we may case first with ethylene or methane and then redistribute with carbon monoxide. It is possible to adjust the gases and procedure so nicely that any desired carburization can be effected to any depth up to 3 millimeters. Time, temperature and pressure can be varied greatly.

There are precautions to be observed in all carburizing processes, of whatever class. While carbon diffuses into the iron or steel and is given up to the iron to form cementite, it must be remembered that other nonmetals and metals also do the same. Any injurious substances in the gases of the carburizing mixtures may diffuse into the steel and cause a deterioration of properties. It is certain that sulphur and phosphorous do this, being especially injurious when carburizing is carried out in the higher range of temperatures. To prevent this injury charred leather or like material containing sulphur, should be sparingly used if at all. Green bone and bone charcoal contain much phosphorus and should not be used where that element is not wanted in the case of the steel. Both elements tend to soften and defeat the object of the case. In one instance phosphides and sulphides were so high in the quenched case that it could be machined, though somewhat brittle from their presence.

The deadly poisonous character of the strong cyanide mixtures for shallow carburizing has led to a search for some substitute less injurious to the health of the workmen. The Shimer process developed by Porter W. Shimer Easton, Pa., uses calcium cyanamide, which it is claimed does not give off poisonous vapors and carburizes at a less cost. Baths of fusible salts such as mentioned in Chapter VI are used, the cyanamide is introduced in lumps forced under the surface, and imparts a carburizing power to the otherwise inert baths. The reaction of the cyanamide with the molten salts is unknown, but a vigorous ebullition of gases takes place. The cyanamide must be fresh, dry and unoxidized. It can be so kept in air-tight cans as are ordinarily used for sodium cyanide.

More Even Heating Sought

We have spoken of the ordinary unevenness of heating when case carburizing in boxes, heated in semi-muffle furnaces (boxes packed tightly and methodically) beforehand. One place in the box rarely seems to have the same temperature as another no matter how even is the furnace itself. Theo. G. Selleck in the *Journal* American Society for Steel Treating December, 1918, advocates the use of a closed muffle for carburizing, accompanied by a pre-heating of the pieces before introducing the carburizing cement. He will either do away with the boxes entirely or modify them so that local inside heat insulation of one piece or part from another will be impossible. The field is large and such effort is the right direction. Something must be done to cut down the percentage of spotted, banded, and spoiled material in the ordinary box method.

As an example of modern practice let us take bolts used in the automobile running and steering mechanism. These bolts must be different in properties from the ordinary stock bolts used in miscellaneous lines elsewhere. Since they must possess great strength and wear resistance, they must be of the best material. The steel used, and which remains as the core after carburizing, has the following analysis; carbon 0.14 to 0.21 per cent; manganese

0.42 to 0.28 per cent sulphur, less than .05 per cent, phosphorous, less than .03 per cent, silicon about 0.10 per cent.

The bolts are cold headed and machined, then packed in boxes of the wood charcoal, barium carbonate mixture, so that each is well spaced in the box. The boxes are placed in a rather cool furnace at about 200 degrees Cent. (392) and allowed to climb in temperature slowly to the carburizing heat of 900 degrees Cent. (1652) which is kept constant for six hours. (It takes about four hours to come to 900 degrees from 200 degrees, allowing the even heating of the material and bolts.) Then the boxes are taken out slowly and cooled without uncovering or breaking the seal. When cool they are opened, dumped upon the screen, the bolts picked out to be heated in lead and a new lot of bolts placed in the boxes with some fresh and some old compound.

Results of Heat Treatment

The carburizing heat has made both core and case very coarse-grained, because 900 degrees Cent. (1652) is in the fast grain growth region for 0.2 per cent carbon steel and higher. The core is refined by heating the bolts slowly in a lead bath to 840 degrees Cent., (1544) which is just about the upper critical point as will be noted by referring to the beginning of Chapter VI. The bath is held at 840 degrees Cent. for 15 minutes, then the bolts are quenched in water, giving a fine-grained and strong core, but a brittle large grained case, because 840 degrees is far above the critical A_1 of the latter.

The carburizing has raised the carbon of the case to about 0.9 per cent average for the outside one millimeter. The A_1 point is 720 degrees Cent., (1328) which is the A_3, A_2, A_1, for a 0.9 per cent carbon steel. The next step is to heat the bolts a second time slowly in the lead bath to 720 degrees Cent., hold 15 minutes to equalize, then quench again in a 10 to 20 per cent solution of sodium hydrate in water. This gives a fine grained martensite in the case at the same time toughening the core. The case martensite then is tempered back to troostite by heating in an oil bath for an hour at 200 degrees Cent. (392). Incidently this drawing the temper toughens the core, and yields practically two steels in one. The outside of the case has a scleroscope hardness of 75 to 85. The heating in lead has prevented scaling, leaving a clean surface needing little sand blasting for polish.

Ball races and bushings are made from steel of approximately the following analysis: Carbon 0.27 to 0.36; manganese 0.87 to 0.66; with sulphur, phosphorus, and silicon as low as possible. This steel after the heat treatment necessitated by the carburization of the case will give a core of the following properties: Elastic limit 49,000 pounds per square inch; tensile strength 80,000 pounds per square inch; reduction of area 60 per cent; elongation in 2 inches, 20 per cent; scleroscope hardness 35; and brinell hardness 175.

After the forging and machining, the rings are packed in fresh compound in the boxes and carbonized at 950 degrees Cent. (1742) for six hours after the usual four hours for arriving at the temperature. They then are cooled slowly in the boxes, removed and heated slowly in salt bath to 850 degrees Cent. (1562), quenched in solid oil, reheated in lead to 750 degrees Cent. (1382), soaked 15 minutes at that temperature, and quenched severely in solution. This last operation may be accomplished by a machine called a jig which gives a shallow water quench as ball races are thin and circular, but steam bubbles may form and make soft spots, so the more severe quench is best. The articles are finished by sand blasting and tempering in hot oil at 225 degrees Cent. (436), for 30 minutes.

The scleroscope hardness of the ball bearing rings and bushings should be 80 to 85. A peculiar microscopic arrangement of hard cementite particles in the martensite matrix seems to give best service. The martensite particles are temper-drawn to troostite in the last above mentioned operation, but the cementite particles are left as they were at the time of the last quench. After the carburizing the case is about 1.2 to 1.3 per cent carbon, but the cementite excess is arranged in a coarse structure at the grain boundaries and in coarse needles, while the matrix is soft pearlite. If an attempt were made to use the ball race in this condition, the pearlite would abrade and the cementite crumble, giving a grit which would give excessive friction and rapidly wear the balls and race. The ring, as a whole, would possess little strength, so would be deformed easily.

As it is, the high first heat causes a solution of cementite in austenite, the quench in oil gives time enough for only tiny spheroids of cementite to separate on cooling, and the second low reheat simply increases the spheroidizing. The last severe quench hardens the near eutectoid matrix to martensite for an ideal ground mass to support the tiny, thickly sown spheres of cementite. These latter afford ideal wear resistance to the case and permit the temper drawing operation to be varied in intensity to give the expected properties to the core.

IMPROVISED TAPPING HOLE, 6 FEET BENEATH REGULAR IRON NOTCH, THROUGH WHICH THE SALAMANDER WAS REMOVED. THE WORK WAS COMPLETED 21 HOURS AFTER THE STACK WAS BLOWN OUT

Salamander Tapped from Furnace Hearth

Usually the removal of the salamander from a blast furnace represents one of the slowest and most costly operations entailed in preparing a stack for relining. Frequently the complete removal of the salamander requires three to four weeks and a large quantity of dynamite to complete the task. At the Frances stack of the St.

Louis Coke & Iron Co., Granite City, Ill. the salamander while still in a molten state was completely removed 21 hours after the final cast according to a log presented in a recent issue of the *Coke Breeze*. Several days prior to blowing out, a trench 6 feet wide was dug the length of the cast house through the sand fill. The bottom of the trench was 12 feet below the floor level at the edge of the furnace foundation and sloped 1 foot in 10 to within 2 feet of the yard level at the end of the cast house.

The upper portion of the trench was sheet piled and shored with timbers. The wood piling was lagged with asbestos board and corrugated steel sheathing to a height of 4 feet above the runner. This made satisfactory retaining wall for preventing the sand from filling the trench.

Immediately after the 4 a. m. cast April 14 the drilling and blasting gang began operations and by 10 p. m. the furnace column was reached and its base exposed. After a final cleanup of debris in the blasted trench, a hole 5½ feet deep was drilled through the concrete under the furnace column. At this depth the bottom edge of the hearth jacket was struck and was penetrated by an oxygen flame.

Fast Progress in Melting

One hour later hot metal began to flow from the improvised tapping hole, 6½ feet below the level of the regular iron notch, gradually filling the eight beds which previously had been prepared from burned foundry sand adjacent to the cast house. At 1 a. m. April 15 all the metal had been cast from the bottom of the furnace and was beginning to cool in the sand, preparatory to being broken up by the skull cracker.

Water then was turned into the furnace and by 1:30 a. m. April 17 it had cooled sufficiently to permit the tearing out of the old lining. Eight days later the old lining and hearth jacket had been removed and the concrete cut away for the enlarged hearth. On April 27 the new hearth jacket was in position and the masons started placing the bottom blocks.

Constructs Large Rotary Kiln in California

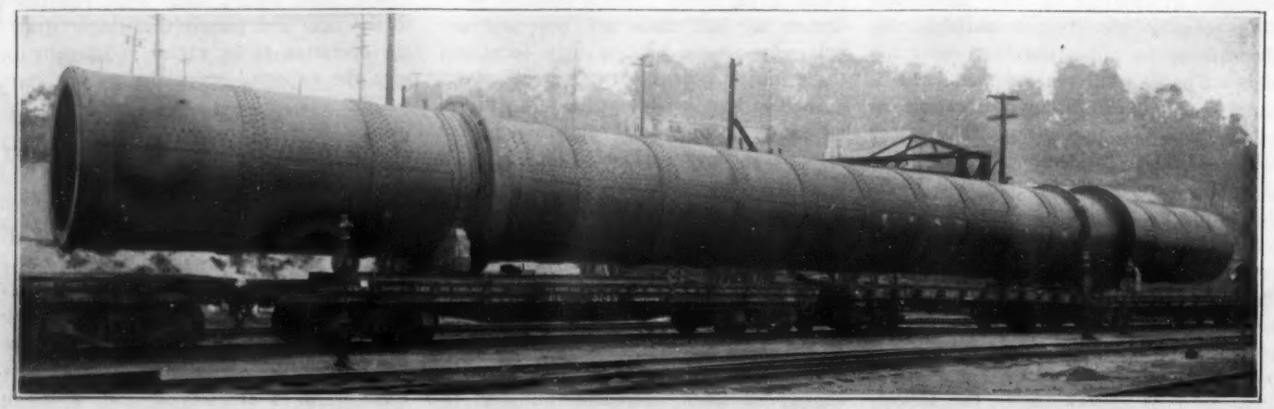
Although the rotary kiln has been used for a long time for the burning of cement rock in the manufacture of cement and later for the burning of lime rock, probably its most recent use is for the treatment of the variety of nonmetalliferous minerals found in great abundance in southern California. The Celite Products Co. has just had constructed for its Lompoc, Cal., plant a special kiln designed for burning the Kieselguhr or diatomaceous earth taken from its quarry at Lompoc This kiln, which is to be used in connection with a new method of treatment of the material, was designed and built by the Llewellyn Iron Works, Los Angeles. It is 9 feet in diameter and 125 feet in length and is made of ¾-inch steel plate. With the riding rings the kiln weighed about 100 tons. The riding rings, trunnion rollers and driving gears are of cast steel. With the driving machinery the kiln weighs 175 tons.

Transportation of the kiln from the shops of the Llewellyn Iron Works in Los Angeles to Lompoc required unusual precautions and called for considerable engineering skill and practical experience in the handling of heavy and difficult loads. On account of the large diameter and length of the kiln tube, it was necessary to mount it on two cars with a spacer car between, as shown in the accompanying illustration. The driving and carrying machinery was loaded on two other cars. The special train consisting of six cars, a caboose and locomotive, left Los Angeles under the supervision of the superintendent of the Southern Pacific railroad wrecking crew, two assistants, the train master and division engineer. Because of the curvature of the railroad tracks and the weight, width and height of the load, the running schedule was set at 8 miles per hour. As the main load was concentrated on one truck of each of the two cars, the danger lay in heated bearings and this, with the high center of gravity of the load, compelled a slow running speed. The total weight of the train and load, exclusive of the locomotive and caboose, was 500,880 pounds.

Power Meeting Program in Second Edition

The American committee of the World Power Conference recently issued a second edition of the program regarding American participation in the conference which is to be held in London, June 30-July 12. This conference, which is the first World Power Conference to be held, is promoted by the council of the British Electrical and Allied Manufacturers' association in co-operation with technical and scientific institutions and industrial organizations in Great Britain and other countries. The meetings are to be held at the British Empire Exhibition, now under way at Wembley, London.

The second edition of the program as well as the first sets forth the objects of the conference and gives the roster of the American committee. Following this is shown a list of organizations co-operating in formation of this committee. The next section gives the composition of the British committee and the national committees for all countries taking part in the meeting. An outline of the program and a complete list of papers for all nations follows A section containing general information completes the book.



TO TRANSPORT THIS ROTARY KILN, WHICH WAS 125 FEET LONG, THREE FREIGHT CARS WERE REQUIRED, THE CENTER CAR SERVING AS A SPACER CAR

Stabilizing Gear Manufacturing

Plants Must Confine Activities to Work for Which They Are Best Suited—Customers' Needs Should Be Analyzed—Production Planned in Advance Makes for Lower Costs

BY L. G. HEWINS

A FEW weeks ago we received in the same mail two letters from machinery manufacturers which were significant from our viewpoint as gear manufacturers. One came from a company we shall call the Big Dividend Corp., a substantial interest, rated at $1,000,000 with first-grade credit. This company uses many gears and is a desirable customer. Its letter stated that it had been making its own gears, but had about decided that it would do better to buy them.

The other letter came from a company we shall refer to as the Well Meaning Co. Its rating was $50,000 to $75,000 with second-grade credit, indicating that as then operating it was not properly financed. In spite of this the company informed us that it had been buying its gears, but had about decided to install equipment and make its own. How they figured they would be ahead by assuming the initial expense of new equipment and the cost of learning to operate it, they did not explain.

These letters suggest certain fundamental questions which confront all gear manufacturers. What position does the gear manufacturer occupy today in the broad field of industry? What great manufacturing service is he rendering that warrants a continuance of his business? As the answers to these questions are vital to the success of the industry and valuable to those it serves, it seems worth while to consider the economic need for the gear manufacturer, and his possibilities for rendering a still greater industrial service.

Let us start with a brief analysis of our market which can properly be divided into three classes of gear users as follows:

1. The man who requires a few gears occasionally, either for replacement or experimental work.
2. Companies using somewhat larger quantities of gears in connection with equipment they produce or operate.
3. Manufacturers who use large quantities of the same kinds of gears, day in and day out.

Referring to the first class, probably we have all had experience with the man who comes into the office all out of breath, sometimes with a greasy gear in his hand, and who wants us to stop everything else to set up machines for a few parts he needs urgently. Often we do help him out, but possibly if we knew and dared to charge what it actually cost us to put through these few gears special for him, we would have to take the rest of his machine in part payment.

Replacements Obtained Quickly

Automobile manufacturers have been quick to realize this situation, and due to their vision of service, it is possible to get replacement gears promptly and at much lower cost than if only a few parts were run through at one set-up. This is both a far sighted and a foresighted policy that could be followed to advantage by many other manufacturers, who use gears in their products.

Passing to the third class, we have the Henry Fords of industry or those who are in a position to control their production, so that they can install highly specialized equipment that gear makers would not be justified in doing, not knowing how long we might have the business. These manufacturers possibly have a stabilized design, with practically no changes in production which would make it necessary to discard considerable expensive equipment. With these few we have little argument.

But there is a limit to the size of any one organization. We are all familiar with the unhappy experience of some of the big consolidations that have become too unwieldy and top heavy. In these days of specialized production the old slogan. "Built under one roof"—does not have the significance it once had. Even the Henry Fords do not make their own tires, and often not their spring frames ignition systems, etc. They recognize the fact that the specialist can show them things they have not known and is a big asset.

We will again refer to the second class of gear users, that large group of manufacturers making equipment requiring gears in various quantities and some of whom are attempting to produce their own gears with varying success. This group requires many different types of gears, which in turn are supplied by as many different classes of gear manufacturers. Most gear manufacturers specialize in one or two classes of work; but only a limited number have facilities covering a wide range of gear production. In the final analysis, there are few of us whose business is actually competitive because if the fitness of each manufacturer to produce a certain class of gears were observed there should not be much reason for anyone to enroach seriously upon the business of another. Economically, we should confine our activities to the work for which we are best fitted, from the standpoint of equipment and experience.

Some manufacturers in this second group have had their own gear equipment from the beginning, while others possibly have been encouraged to install gear cutting machinery, on account of what they considered slow delivery, high price or some other form of poor service on the part of gear manufacturers. Although usually it can be shown that economically these manufacturers were not justified in the addition of a gear department, they have installed one and some of the responsibility can be laid at the gear manufacturer's door. With a little more vision, we might have satisfied these customers, have saved them money, and incidentally increased our own business.

All gear manufacturers have found an inclination on the part of some manufacturers to procrastinate about their gears until the rest of their equipment was practically ready for the gear installation. They then come to us for assistance and want quick deliveries. Of course, this means rush delivery; picking up material anywhere it can be purchased promptly; with little opportunity to get the best prices. The work must be rushed through the plant at an increased production cost and, frequently, at some sacrifice in quality.

Is it not our fault that this condition has been permitted to prevail so generally? It has afforded excellent opportunity for machine tool manufacturers to step in and present some apparently convincing arguments why

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From a paper presented at the annual meeting of the American Gear Manufacturers' association, Buffalo, April 28-30. The author is sales manager, Van Dorn & Dutton Co., Cleveland.

the manufacturer should install gear equipment. The first thing they do is figure theoretical costs on the basis of a year's production. We agree that these theoretical figures look interesting on paper, and when a gear user thinks he has not received the service to which he is entitled, he is inclined to lend an ear to these low gear cost figures which are seldom based on actual production conditions that will exist in his plant.

Buy To Better Advantage

In most of these cases the manufacturer can purchase better gears at lower prices from one of the reputable gear manufacturers. Even some of the makers of gear cutting machinery find it desirable to purchase gears for their machines. It might be well to see how the "home-made" gear matter actually works out.

1. Often through lack of experience, the customer finds he is unable to get the quality desired or as good as he had obtained from the gear manufacturer. Gear manufacturers are gear specialists who should be in position to supply just what the manufacturer needs when he needs it.

2. In hundreds of plants it is found that gear equipment is idle a large part of the time. Manufacturers will not countenance idle men around their plants, they discharge the men; but for some unaccountable reason they will not fire their idle machinery. Idle machines take up valuable floor space; they depreciate whether idle or busy; they require cleaning and attention; they must be insured; and in a dozen ways they help feed the wolf that stalks at every manufacturer's door—overhead.

3. Still other plants have only sufficient gear work to keep their machines busy 50 to 75 per cent of the time. In such cases, there is a tendency for men on these machines to slow down so that the work will last for the full year. It is human nature for a man not to work himself out of a job. The writer has seen a six weeks' gear cutting job stretched into two months and a four months' job into six months. After all, it is the productive hours that count, and to hold down costs, the man-hours must be 100 per cent productive.

4. Turnover on material and labor investment is slow. To have his gears available when needed and to avoid tying up too large an investment in equipment, the manufacturer sometimes finds he must produce part of his gears months before he needs them. As an illustration, we have a good customer in the east who builds machines requiring months to complete. This customer has gear equipment of his own, but within the past three years we have demonstrated that we can save him money. Although he had a battery of gear cutters, in order to have all of the various parts ready when needed, it has been necessary for him to start producing in January gears for equipment that would not be completely assembled for shipment until September or October or even December.

5. From time to time manufacturers step up their production schedules. If they are buying their gears from a dependable source, they have much greater flexibility. If they are making their own gears they might find it necessary to set up additional gear equipment to handle this peak load only to let it stand idle afterwards. The gear manufacturer, with better plant facilities and serving hundreds of customers, can adjust himself to these peaks and valleys. He is a shock absorber both in times of overproduction and underproduction. Many manufacturers appreciate that during periods of depression the gear manufacturer is holding the bag.

6. How many manufacturers who install gear equipment give thought to the fact that their machines if used only part time, may become obsolete as to method and efficiency long before they are worn out. In other words, they may be using machines that require more time for certain operations than the gear manufacturer who has more up-to-date equipment. When the company equipped for making its own gears uses only a few gears during the year, one sometimes finds the superintendent of the plant, or perhaps a tool room foreman running the gear machines. A few years ago the argument might have been that these men would not have been doing anything else anyway. But, most wide-awake manufacturers are no longer figuring costs in this way, and if any of them still are, is it not perhaps our fault?

7. Sometimes, a manufacturer needs ordinary gears and heat treated or hardened gears in the same machine. If he has no heat treating facilities, he is tempted to use ordinary gears throughout and thereby lower the quality of his product. The gear manufacture has a flexibility and a full range of service that ordinarily can not be duplicated in any isolated plant.

8. Many manufacturers who have thought this matter through have concluded that they can use their capital more advantageously in exploiting their own sales than by investing it in expensive gear cutting equipment. They are willing to let the gear manufacturer, the gear specialist, wrestle with the many intricate problems incident to the business.

Must Give Full Service

These few points prompt the question: Is there good reason for a manufacturer in the middle group going to the expense of installing gear equipment, when throughout the country he can find experienced gear makers with ample facilities, who have devoted years of effort and study to the production of gears; who can with intelligent planning give quality and service at a cost below that of producing his own gears; and through whom he he can consult with engineers who will gladly give him the benefit of accumulated experience of years?

We should be interested not only in selling gears, but should endeavor to give our customers the advantage of all we have learned about design, material, heat treatments, etc. Our aim should be to supply the gears most suitable for each particular application. Many times we feel that the needs of the customer might be quite different from the specifications submitted to us, and considerable tact is required in making our recommendations, because it is not uncommon to encounter an engineer who is not convinced we can show him anything about his gear installation.

Specifications Are Analyzed

On a job of any size it is the practice of our company to analyze the data submitted with the inquiry, and if this gives us sufficient information about the application we can immediately proceed with estimates. Usually, however, the inquiry or specifications are not sufficiently complete; they do not indicate loads, speeds, operating conditions, what parts have given trouble previously, whether this trouble has been due to breakage, etc. We then ask for this additional information, including assembly prints.

Thus we get quite a comprehensive history of the case which enable us to make a complete intelligent analysis. A little more time and work are involved, but it is found worth while.

A certain large manufacturer whose gear requirements usually are rather limited, decided several months ago to make some improvements and additions involving a quantity of gears. It was unusually attractive work, and we were given an opportunity to figure on it. While analyzing the specifications submitted, we came to the conclusion that we could save this customer money by making some changes. When quoting, therefore, we made two separate proposals; one on the basis of the specifications submitted, the other, our recommendation, which involved cutting down the pitch and width of face, enabling us to machine and heat treat the gears by means of special equipment used in producing gears for the automotive trade.

It required a little effort to satisfy the customer's engineers that our recommendation would stand the gaff but we sold them and the installation has proved to be quieter and more permanent than the customer ever expected he would be able to get. Possibly, it may have seemed to others who figured on the job that our prices were low, but as a matter of fact we made a fair margin of profit, and saved the customer several thousand dollars.

This illustrates two points already touched upon namely that the gear

manufacturer can be of constructive service, and that what he is able to do for a customer is dependent to some extent on what class of work that particular manufacturer is best equipped to handle.

Gear manufacturing plants may be divided into four classes as follows:

1. Plants which are particularly equipped for rush jobs, whose organizations are such that they can undertake jobs almost immediately as compared with the larger organization where this is not so easily possible.

2. Plants which can handle larger quantities of gears to better advantage, specializing on cast iron or untreated steel gears and therefore not needing heat treating facilities.

3. Plants specializing on certain classes of quantity work, either large or small gears

4. Plants which seek high-grade gears for applications where the greatest accuracy and strength is demanded, involving high-grade alloy steels, heat treatment, etc.

Economically, we should so far as possible, confine our efforts to the work we are especially equipped for, regardless of how badly we may need business. We do not want to overlook the fact that the American Gear Manufacturers' association is accomplishing much through its standardization work, and in other ways, that enables us to be of greater service to customers. Recently, a prominent machine tool manufacturer, in discussing a job, asked the question if there was not some way of checking gear cutters. While explaining some of our methods for inspecting and checking various equipment necessary for producing high grade gears, it developed that this manufacturer did not realize the difference between gears cut by the rotary method, as compared with those generated on a hobber or gear shaper. Although these people are generally recognized as first-class machine tool manufacturers, building machines that many of us are using daily they still have much to learn about gears. But the average machinery manufacturer has so many other things to think about that we reasonably do not expect him to know everything about gears.

Gear Manufacturer Needed

Already it has been mentioned that possibly it is our fault that users of gears have not been sold more universally on the advantages of shifting to a reliable, dependable gear manufacturer the responsibility for supplying gears that will perform with a maximum of efficiency in their equipment, that will stand up satisfactorily in service, and that often will actually increase the value of their product.

Apparently there is no question about the need of the gear manufacturers. We do need to be more thorough if we are to benefit by the opportunities that exist for being of constructive service. We should analyze our customers' needs more thoroughly, even help them plan their production schedule if necessary. In this way we not only give the customer better gears, when he wants them and save him money, but we secure for ourselves the confidence of the manufacturers and a better balanced production.

Can Equalize Production

By planning farther ahead often we can bring through in advance material for operations on special equipment that might otherwise have been idle, and thus avoid the periods of feast or famine which so often have confronted us. We can also schedule operations for machines best suited for the particular work, and give the customer the benefit of time studies and more consistent piece-work rates. Time is also allowed for the proper handling and inspection of material between operations. Fewer setups are necessary, which means gears more uniformly interchangeable and reduced costs. We are enabled to ship in car lots where the quantity justifies, thus saving freight and handling costs at each end. Finally the customer has gears when he needs them, thereby avoiding costly delays.

A recent experience illustrates some of the points just brought out. One particular customer's gear requirements aggregate nearly $100,000 annually and we have been supplying them for many years. The purchasing agent, who is recognized as an able buyer, had been placing orders as the requisitions for gears came through to him, as is customary. But, like the average organization, the requisitions usually did not reach him until about the time the gears were actually needed with the result that they were habitually ordering in small quantities and delivery in our plant had to be rushed without any time to analyze or study the customer's specifications.

In fact, we did not have sufficient time to determine the best source for the material. It was a matter of buying for quickest delivery. This meant that our production schedule was continually being thrown out of balance, and frequently it was necessary to make shipment by express or even special messenger. This ran up the cost of production and the situation was most unsatisfactory all around, for although we were using our best efforts to get the material through, the customer was always more or less dissatisfied with the quality and service; our sources were tiring of rush deliveries; and we could not plan our production intelligently. Regardless of the unusually friendly relations that existed under these conditions we were on the verge of losing the business.

Finally, we concluded that we must plan farther ahead but apparently the only way we could do this was to make some incentive for the customer to plan ahead. Therefore we went to our sources put the proposition up to them, sold them on the advantage of at least attempting to plan their production more nearly on a continuous basis, and as a result, secured attractive material prices. With these as a basis, we worked up a schedule of prices for three month's requirements, with various price ranges, so that the customer could readily determine just what saving could be made if he could plan ahead.

Naturally, we sold them, too, and ever since we have been planning in this way, with the result that the customer is better satisfied. As a matter of fact, on the strength of the first three months' showing the purchasing agent and his assistant who had helped work this schedule out with us received a substantial increase in salary.

Experiment To Strengthen Airship Girders

To determine the possibility of obtaining greater strength for the same weight in airship girders, the bureau of standards is undertaking a series of tests. Such girders carry loads in compression or bending or both and their strength depends upon their design as well as upon the strength of the material. In the best duralumin girders the bureau finds it possible to apply a load of only 20,000 pounds per square inch of the metal, whereas the metal itself will not yield under compressive stresses of over 30,000 pounds per square inch. It is believed that better design, resulting from making all parts equally strong, may result in the strength of the girder approaching more nearly the strength of the metal. The correct calculation of the strength of these girders is considered impossible, therefore it will be necessary to make girders and girder parts of various promising designs and to test them for strength.

American Armor Corp., New York, has increased its capital stock from $500,000 to $30,000,000.

What the Reader Says—

Samuel Rogers Declared To Have Been First Inventor of Tack Machine— Discusses Method of Selling Structural Steel

Who Invented the Tack Machine?

To the Editor:

In your March 17 issue you have a very interesting article on the "invention and early use of the tack machine," in which Thomas Blanchard is given credit for being the inventor of the machine for making tacks. I am, however, in possession of conclusive evidence that while Mr. Blanchard did invent a tack machine, Samuel Rogers, of East Bridgewater, Mass., was also the inventor of both the tack machine and the cut nail machine, and that he held a patent prior to that issued to Mr. Blanchard. Rogers' machine was built and in use several years prior to Blanchard's.

The patent issued to Samuel Rogers, was, I believe, signed by James Madison, and for many years these patent papers were treasured heirlooms in my wife's family. Mrs. Sheldon, was Mary T. Rogers, a great granddaughter of Samuel Rogers, and still has several very interesting and important mementos of her great grandparent, among which is a banjo clock that Samuel Rogers used as a "register" in his clock and watch shop, mentioned later on.

In substantiation of the claim I am making for priority of the Samuel Rogers' invention, I quote verbatim from a letter written by Samuel's son, Capt. Charles Rogers, in January 1877 (then 78 years old) to William Allen of Boston, who at that time was engaged in writing a history of the town of East Bridgewater, Mass., where Allen formerly lived:

East Bridgewater, Jany. 1877.

Dear Sir:

I received your letter of December 22 and in answer to the questions therein I will do the best I can at this late day....

My father made the first nail by one operation, by turning a large crank, about 1800....

The first knowledge we had of Blanchard's tack machine, we saw it standing in a wagon in the road between Wm. Hydes house and ours, in the summer of 1817. Mr. Hyde called my father out and they put it in motion by crank and made tacks. My father invited him (Blanchard) into the house where, to Mr. Blanchard's great astonishment, he found my father had invented and previous to him, applied for a patent for the double cutter, or in other words the upper knife being in two parts. Blanchard having previously bargained with Benjamin & Elihu Hobart for the patent right, he was on the way there with it, they (Blanchard and Rogers) having invented the same thing without each others knowledge of it, he in Conn. and my father here in Mass. Mr. Blanchard spent 2 days with my father; they then both went to Abington (to Hobart's factory) and they gave my father a certain sum and he gave the exclusive right to Mr. Blanchard.

My father (Samuel Rogers) was born in Marshfield, (Mass.) July 16, 1766, and he began to show his mechanical ingenuity very young; by the help of his father's tools, at the age of 14 years he had made a clock of wood and brass and set it up in the front room closet, by making a hole through the shelf which is there now to be seen and kept good time: it was more wonderful as there was no clocks made any where in that region. John Baley a Quaker was then at work at the clock business then at Pembroke, (Mass.) near Indian Pond, afterwards at Hanover, (Mass.) His (Samuel Rogers') father concluded to let him learn the clock, watch and jewelers trade of him, (Baley) to stay till 21 years old. Then as I have always understood, Sylvanus Lazell induced him to come and set up his business here.

After making what tools he wanted to begin with, he (Samuel Rogers) came here April 3, 1788 with one silver dollar in his pocket, his father gave him. Lazell then provided him with a shop then standing near where the Brick Store is, and after the turnpike was commenced Lazell moved it down to the south end of the bridge on what is now Bart Trows lot and was taken down about 3 years ago. His father then bought him 18 acres called the Forge Lot of Edward Robinson, about 1790. He then took his brother Isaac (Rogers) as an apprentice to learn to make clocks. After working together a year or two the thought came to him (Samuel) to make a nail machine. After experimenting by odd jobs he got it completed so as to make nails by turning it with a crank and the help of the *balance wheel;* this balance wheel is something he did not think of until he began to operate his machine and found it needed something to equalize the motion and is probably the first time the balance wheel, now thought to be of so much importance, was ever used.

Capt. Nathan Russell, a merchant then living in the Jos. Lazell place, after having seen the operation of the machine saw at once there was money to be made with it, made a contract to purchase the right and set the business up. Capt. Russell then got Samuel Spear, then a wealthy man to share with him and bought a privilege in Plymouth, then owned by Martin Brimmer of Boston, had been used as a Grist Mill and Slitting Mill for nail rods.

After building a new Rolling Mill and Nail Factory, and the work on the dam, it was about 1806 when my father (Samuel Rogers) began to set up his machines and passed the whole of his time there and in 1809 he moved his family there and remained there about 4 years. The works proved very successful and was a very great help to the town of Plymouth.

About the year 1801 or 2 he made 2 Silver Watches, every part but the main springs complete. He soon after sold them both, one of which we have never heard from but one was found and purchased and is now in my brother Jacob's family. They are without doubt the first watches ever made in this country. I think there was no tool that he ever used that he did not make himself. You will not expect me to describe all the inventions he has made or patents he has taken out, but I think I can say that to my knowledge there never was his equal in inventing and at the same time in executing all the work himself up to his time.

After leaving Plymouth he spent most of his time in improving his land, with some watch work, etc. He died July 17. 1838 aged 72 years.

From the foregoing letter it will be seen that Blanchard recognized the priority of Rogers' invention and purchased the right to use it on his tack machine. Rogers, previous to his meeting with Blanchard had used his invention successfully in his business in Plymouth for a number of years. It is also evident that no practical use was made by Blanchard of his tack machine till 1817 when he sold his rights to Benj. & Elihu Hobart of Abington, Mass., after he had purchased Samuel Rogers' patent rights.

In further evidence of Rogers' inventive genius, I am copying below a receipt given for money received for sale of a patent lathe.

Bridgewater, Sept. 11, 1822.

Mr. James Carter—Sir

Please pay Mr. Alpha Allen the bearer Twenty-five Dollars and this will be a discharge for the remander deue me for a pattent lathe for turning rowls now erected at Dover Iron Works.

Saml. Rogers
Bridgewater

Samuel Rogers was also the inventor of the "heading die" for nail and tack machines. Previous to his invention nails were cut without heads

and then headed by hand. Rogers' invention not only made a complete and perfect nail, but also greatly increased the output and cheapened the cost of manufacture. He operated a nail factory in East Bridgewater for some years, in the section known as "frog hall," on the creek above the forge pond.

While Rogers' invention of the heading die and the two-piece cutting die was of great importance, and perfected the nail machine as it is in operation today, the credit for it was never given to him, but to Blanchard and to a Mr. Reed who built nail machines and used Rogers' heading device. The cut nail machine has always passed as the "Reed" machine notwithstanding it was actually Rogers' invention.

William O. Sheldon, sales manager,
THE YODER CO.,
Cleveland, April 16, 1924.

Problems in Selling Structural Steel

To the Editor:

This company was much interested in your editorial "Free Service Increases Cost" in your recent issue.

With reference to the first paragraph, we believe you might be right, especially where concerns prepare expensive preliminary plans with complete specifications and data. However, it is different with our particular company, and probably a great many others of the medium size structural shops, so we do not agree with you. Selling structural steel in our experience is not an easy job. Competition is keen and this work is all special, no two jobs being alike, and it is particularly difficult to run a shop on an even balance for amounts of tonnage shipped.

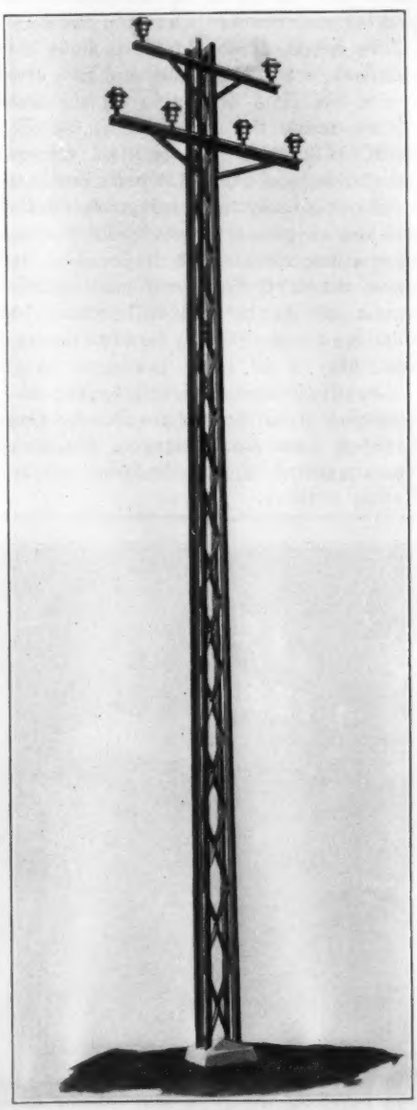
To get back to engineering work, our structural engineers have specialized in designing buildings and similar classes of work, and it is really not much of a job to make most structural designs. The actual engineering figuring is considerably less than people realize. We never make very elaborate details, but furnish only such data that will give our prospective customer a definite idea of what we intend furnishing.

When preparing a separate engineering design we generally deal with the customer direct, and this makes a single sale. It is the writer's recollection that we get at least one job out of three where we prepare designs. On general business our average is much less than this. Usually every owner, contractor or architect gets four or five bids and a large percentage of the work does not go through, so the average for jobs that we can obtain against jobs figured is probably one out of eight to 12. This may be low as a general average.

This firm does not make a practice of competing with architects and engineers, but in most cases works with them. But we have to exist and owners, contractors, and others apply to us for information, and to get the work we have to use all selling methods.

We do, however, agree with you on the second paragraph of your article. Practically all general contractors, or nine out of 10, seek lower prices after being awarded a contract. Many of them will deny this but we happen to be subcontractors and know this is the case.

This class of work means that the contractor gets from three to eight bids before obtaining his contract, and then as many more as possible. Some subcontractors make a practice of giving general contractors bids only when they have a job, and even if the general contractor cannot secure additional bids, they make some revisions which means selling every job twice. If you prepare your own designs you only have to do this once, so selling on your own designs, we believe is less than half the cost of doing business through general contractors.



THIS NEW STEEL POLE IS PRESSED FROM CHANNELS OR I-BEAMS

Most of the structural work let to general contractors is from architect's offices. Engineers in most cases let their structural work direct. This makes a single sale for the job. We get the work if our price and delivery are right, on one estimate. The reason for many of the general contractors obtaining general contracts is that architects as a class are not paid sufficient to supervise the work and the cost of this has to be done somewhere, though in most cases savings to the owner can be made if work is let direct. Another reason for contractors always including structural steel is that there is no association of structural steel men. The ventilating, electrical, and heating and plumbing contractors, and one or two other trades, have very good associations, and bid their work direct. They only make one sale.

There are numerous other troubles with this business, but we do not believe that a salesman in the structural business can convince general contractors or any association of general contractors that they should quit taking bids when they have a contract, and that they notify the successful bidder immediately, though this does happen if one is especially low on a bid.

We manage to exist pretty well in spite of this, but as you say, we agree it makes considerable addition to sales cost.

REPUBLIC STRUCTURAL IRON WORKS,
J. Lehman, Secretary.
Cleveland, April 24, 1924.

To Begin Manufacture of Steel Poles

The steel pole department recently organized by the Truscon Steel Co., Youngstown, O., now is ready to begin production on a quantity basis and is prepared to manufacture all sizes of copper steel poles up to 50 feet in length. The poles are pressed from 5 to 12-inch steel channels or I-beams and are so designed that no special equipment is needed by the lineman in ascending or descending. As shown in the accompanying illustration, the pole is made by pressing out to a determined angle a portion of the web of the channel or I-beam, then riveting this pressed-out section to a similar section of another channel or I-beam.

Tests have been conducted on the

new product for the last two years. Where more than ordinary strength of pole and extra length is required, the pole can be made in combinations of two or more, thereby giving a structure of great strength, suited to carrying long spans on transmission lines and other heavy duty. A complete line of fittings has been designed to fit any size standard crossarm, either wood or steel. These fittings are all galvanized. It is claimed that painting of the pole is necessary about once in five years.

Designs Portable Gas Dryer for Molds

By Albert Zander

A novel apparatus for drying molds with manufactured gas, which is applicable to a great variety of work, recently has been introduced at the Kedzie Foundry Co., Chicago. The mold dryer is about 9 inches in diameter and 24 inches long. Its weight is such that it may be carried about easily and hung on flasks at convenient points. Air and gas are fed into the dryer through two flexible rubber tubes. The device is covered by a seamless steel shell, 8⅝ inches in diameter, ¼ inch thick and 18 inches long. Inside this cover is the inner steel shell. Separated by an intermediate air space from the outer shell the inner shell is lined with firebrick, perforated with holes at regular intervals.

A circular cover plate is fastened securely at the top of the inner and outer cylinder and the gas and air connections are screwed into this plate, admitting both gas and air to the inner, firebrick lined cylinder. About a third of the way down from the top another air connection is screwed into the outer shell. The gas first is turned on and ignited by a torch through the lighting hole at the bottom of the device. The air, which is supplied by a fan blast, then is admitted. This fills the outer chamber and rushes through the perforations in the firebrick, to the inner or center chamber.

A small amount of the air, admitted at the top, combines with the raw gas and partial combustion takes place. As the gas passes toward the bottom of the interior cylinder, more air enters through the holes in this cylinder and consequently the combustion becomes more complete. Finally, the mixture of air, gas and the products of combustion are passed into the mold. By circulating through the mold the necessary baking and drying is accomplished.

More air is delivered to the combustion chamber through the perforated firebrick than at the top. Air at a pressure equivalent to 4 inches of water column generally is used. However, compressed air may be used with the aid of an inspirator to reduce the pressure. The outer layer of air keeps the steel shells and outer surface of the refractories cool.

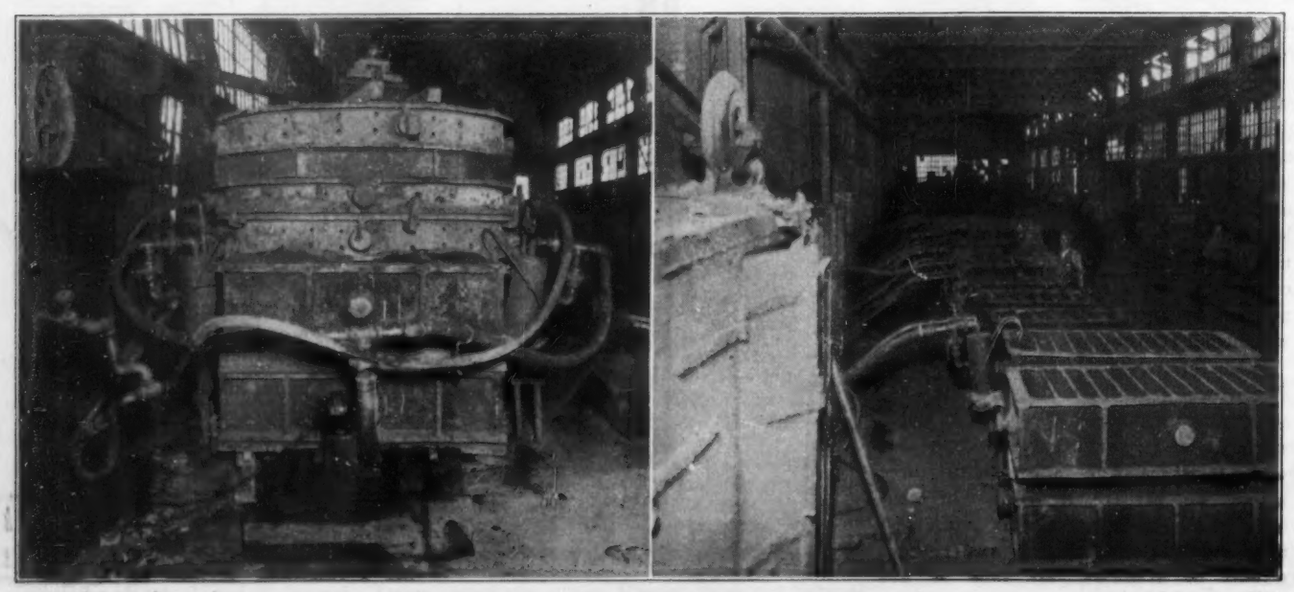
The gas-fired mold dryer is hung on the flask, set in operation, and in a few hours, the time depending on the size of the mold, the interior surfaces are dried. The cope then is lifted off for general inspection, and when replaced the mold is ready for pouring. Adequate gas and air piping together with flexible hose connections make it possible to move the dryer from one mold to the next as fast as the work will permit. In this way the device may be kept in constant use.

The dryer was designed by the engineering department of the Peoples Gas Light & Coke Co., Chicago. The idea was suggested by John Anderson of the Kedzie foundry.

Would Make Machine Tool Motors Standard

A formal proposal for standardization of important dimensions of electric motors for use on machine tools has been made to the American Engineering Standards committee by the National Machine Tool Builders' association. In presenting the recommendations to the committee, E. F. DuBrul general manager of the tool builders' association, stated that great loss is caused to users of machine tools by the present lack of dimensional standardization, particularly in the distance between the motor feet, both longitudinally and laterally, and also the height of the motor shaft from the bottom of the feet. Tool builders believe that this distance could and should be standardized for motors of a given rating so that the same base plates could be provided regardless of the make of the motor. The number of revolutions being standardized, this dimensional standardization should prevent no serious difficulties, it is thought.

"Our American System of Weights and Measurers—Why We Should Keep It" is the title of a 64-page pamphlet recently issued by the American Institute of Weights and Measures, 115 Broadway, New York. It is attractively illustrated and in a popular way sets forth some of the arguments against the efforts being made "to take away from the American people their traditional system of weights and measures and by the compulsion of law to force the adoption of the metric system in its place."



(LEFT) DEVICE APPLIED TO LARGE MOLD FOR CASTING 1½-TON LEAD KETTLE (RIGHT) A BATTERY OF GAS FIRED PORTABLE MOLD DRYERS MAY BE USED

British Steel Industry Expands

Present Iron and Steel Productive Capacity of Great Britain Together with Probable Trend of Future Development Is Outlined—Economic Factors Affecting Imperial Trade and Enterprise Are Presented

BY W. J. LARKE AND M. S. BIRKETT

BRITISH industry in 1913 generally enjoyed one of those periodic "boom" years which occur in the course of the trade cycle, and in this prosperity the iron and steel industry shared. The output of pig iron attained the record figure of 10,260,000 tons, a figure never again reached, while the production of steel ingots and castings amounted to 7,664,000 tons—a figure higher by 867,000 tons than that of the preceding year, which had been the highest output so far recorded. Exports of iron and steel at 4,969,000 tons also constituted a record. Prices, too, were good—to quote only two examples, the ascertained price of Cleveland and No. 3 pig iron averaged £3 per ton—the highest figure recorded since 1900 (when it was £3 8s. 1d.), and steel plates averaged £7 2s. 7d., again the highest since 1900, when it was £7 19s. 0d. The result of the war, with its demand for steel and still more steel for munition purposes, was not only enormously to expand our productive capacity, but also greatly to improve our technical efficiency.

Blast-furnace capacity was not expanded to anything like the same extent as was the steel-furnace capacity—partly because of the length of time necessarily taken in the construction of blast-furnaces, especially when labor was so scarce, and partly because it was possible to conserve the pig iron produced for the use of steel making by restricting exports of pig iron; restricting the production of non-steel making pig iron and devoting a larger proportion to steel making; and increasing the use of scrap in the steel furnaces. Thus exports of pig iron fell from 1,125,000 tons in 1913, to 483,000 tons in 1918, the production of forge and foundry iron declined from 3,801,500 tons in 1918, to 2,301,800 tons in 1918, while the proportion of scrap used in the steel furnaces increased from about 30 per cent, of the charge to about 50 per cent, such a high proportion being rendred possible by the accumulation of steel turnings from the shell shops. With regard to blast-furnaces, therefore, energies were mainly concentrated on repairing old furnaces and bringing them into commission. The 20 new blast-furnaces that were erected were completed only after the cessation of hostilities, but they were of the latest type and will compare favorably both as regards technical efficiency and output with any in the world.

Table I shows the number and capacity of open-hearth furnaces before and after the war, from which it will be seen that the open-hearth furnace capacity was increased by 66 per cent; that the number of small furnaces of 20 tons and under was reduced from 141 to 62, and the number of furnaces of 60 tons and upwards increased from 66 to 179.

In planning these steelworks extensions care was taken as far as possible to insure a balance between furnace capacity and rolling-mill capacity, and in many cases the capacity of the latter also was considerably extended e.g. to meet the increased demand for plates for shipbuilding, tanks, etc.

Another improvement due to the war was the practical supersession of the old beehive non-recovery coke ovens by more modern by-product ovens. The number of beehive ovens in 1913 was 13,167 and fell by 1922 to only 2687, while the proportion of coke produced in by-product ovens rose from 58 per cent, in 1913 to 80 per cent in 1918. While this change was made primarily in the interests of obtaining the by-products of coal combustion for the manufacture of explosives it also reacted to the benefit of the iron and steel industry.

Considerable progress also was made during the war with electric steel furnaces. Before the war not only Germany, but also the United States, Italy, and France were ahead of Great Britain in the production of electric steel, but as the result of the war, the capacity of Great Britain is now second only to that of the United States and Germany. From an output of 10,000 tons a year, production was raised to 100,000 tons in 1918, and the capacity, if all furnaces were worked to their full extent, is now about 300,000 tons a year.

The effects of the war upon the industry have been treated at some length because it appeared desirable, at a moment when the industry is suffering from a certain measure of financial depression, to emphasize the fact that not only did the industry reach its highest output in 1913, but that the result of the war was to improve the position of the industry considerably with regard to capacity, equipment, and quality of output. Tables II and III show for Great Britain the number of

Table I

Open-Hearth Capacity 1912 and 1922

Nominal Capacity of Furnaces	Dec. 31, 1912 Total No. of Furnaces	Dec. 31, 1912 Total Nominal Capacity per Heat	Dec. 31, 1922 Total No. of Furnaces	Dec. 31, 1922 Total Nominal Capacity per Heat
		Tons		Tons
10 tons and under	31	277	18	146
Over 10 tons and under 20	9	130	11	170
10 tons	101	2,020	33	660
25 tons	25	625	27	669
28 tons	6	168	6	168
30 tons	104	3,120	68	2,040
35 tons	30	1,050	83	2,905
40 tons	113	4,520	107	4,280
45 tons	4	180	23	1,035
50 tons	39	1,950	116	5,800
55 tons	....	....	24	1,320
60 tons	28	1,680	111	6,660
65 tons	7	455	11	715
70 tons	12	840	17	1,190
75 tons	....	....	4	300
80 tons	3	240	7	560
85 tons	3	255	3	255
90 tons	....	....	1	90
100 tons	5	500	5	500
Over 100 tons	8	1,545	20	3,445
Capacity, Estimated	8	300	....	....
Total	536	19,855	695	32,908

Abstract of a paper presented before the iron and steel section, Empire Mining & Metallurgical Congress, London, June 3-6.

Table II

Number of Plants Producing Steel in 1920

District	Total No. of works	No. of works producing: Under 25,000 Tons	25,000 to 50,000 Tons	50,000 to 100,000 Tons	100,000 to 200,000 Tons	Over 200,000 Tons
1. Derby, Leicester, Notts., and Northants	13	5	3	4	1	..
2. Parts of Lancs. and Yorks*						
3. Lincolnshire	3	..	1	..	2	..
4. North-East Coast	10	2	..	2	2	4
5. Scotland	9	..	2	1	3	3
6. Staffs., Shrops., Worcester and Warwick	9	3	1	2	2	1
7. South Wales and Mon.	18	..	2	9	5	2
8. Sheffield	28	18	2	5	2	1
9. West Coast	2	..	..	1	..	1
Total	92	28	11	24	17	12
Total prod., 1920**	8,966,400	195,600	461,900	1,715,300	2,445,500	4,148,100

** Works making castings only have been omitted.
* *I.e.* those parts not included in Districts 4, 8, and 9.

blast-furnaces and their capacity and the number of steelworks with their outputs in 1920, the year of highest production since the war.

Table V gives the salient figures relating to the industry for the post-war years with 1913 figures given for comparison. The effect of the post-war "boom" in 1920; of the reaction, accentuated by the coal strike in 1921; and of the slow recovery throughout 1922 and 1923 is apparent, and there is some satisfaction in recording that in 1923 production of pig iron and steel exceeded that of France, Belgium, and Germany, and was second only to the United States, while exports were higher than from any other exporting country. This was due largely to the limitation of production and dislocation of transport on the Continent owing to the occupation of the Ruhr, and the intense domestic demand in the United States restricting the volume of exports from those countries.

At the same time pig iron output was only 72 per cent of that in 1913, while in spite of greatly increased capacity the steel production exceeded that of 1913 by only 825,000 tons, and exports of iron and steel were only 87 per cent of those of 1913, and even these relatively satisfactory figures of output and exports were only secured at considerable financial sacrifices on the part of the manufacturers. This would be evident from an examination of iron and steel companies' balance sheets, but is also sufficiently clear from a consideration of the relative price levels of iron and steel and other commodities in 1913 and the post-war years.

Moreover, if the detail of the vast number of unemployed is studied it will be seen that the highest proportions of unemployment are to be found in iron and steel industries, and in those consuming iron and steel, the figures for the iron and steel industry at the end of March being as follows:

	Per cent Males unemployed
Pig iron	11.8
Wrought iron and steel plants	16.3
Iron ore mining	22.6
Total, all industries	10.3

That these figures suggest that the iron and steel industry is suffering more than other industries is to some extent due to the fact that large numbers were drawn in to iron and steel and the engineering industries as a result of the war demand.

Iron Industry Best Index

Such depression as exists in the iron and steel industry is not inherent in the industry which was never better equipped than at the present time, but as was pointed out by Sir Lowthian Bell in his classic evidence before the Depression of Trade Commission of 1885-1886 that: "Iron being wanted for almost every industry is the one of them upon whose head the misfortunes of all the other industries ultimately fall. If the cotton trade is bad, the cotton spinners require less machinery; if the mineral trade is bad, the railways require a smaller amount of accommodation; fewer rails are required and less rolling-stock. And the same observation applies with regard to ships." This dependence of the iron and steel industry on general conditions of prosperity is recognized by economists who accept the production of pig iron as the best single index of industrial prosperity.

All wars since gun-founding was invented have first stimulated and then depressed the iron and steel industry. Eckel has pointed out that the rate of growth in the iron and steel industry was less in the decade following the Napoleonic wars than in any other decade, and gives the following figures:

Decade ending	World iron output, per cent increase
1810	38
1820	33
1830	83
1840	71
1850	57
1860	72
1870	77
1880	52
1890	49
1900	46
1910	62

Had even the low rate of increase for 1810 to 1820 been attained between 1910 and 1920 the world production of pig iron in 1920 would have been 86,000,000 tons, while had the rate of increase which had obtained in 1900-1910 been maintained, the world would have called for 105,000,000 tons of pig iron in 1920, instead of which the total world output in that year was only 60,277,000 tons and in 1923 65,780,000 tons. An analysis of the world's production of pig iron and steel in 1913 and since the war is shown in Table IV.

Severe as has been the depression following upon the Great War, it is not comparable to the aftermath of the Napoleonic Wars, while the ad-

Table III

Blast Furnace Capacity in United Kingdom

Weekly Rating of Stacks	Theoretical Capacity: Number	Theoretical Capacity: Weekly Capacity	Potential Capacity: Number Stacks	Potential Capacity: Weekly
England and Wales:				
Under 250 tons	11	2,440	8	1,740
250 and under 500 tons	60	23,200	50	19,650
500 and under 750 tons	82	49,550	57	34,780
750 and under 1000 tons	107	89,350	91	75,900
1000 and under 1500 tons	76	86,220	63	72,150
1500 tons and over	14	27,300	9	18,800
Estimated	35	19,940	20	13,980
Total England and Wales	385	298,000	298	237,000
Scotland	102	30,000	90	27,000
Total United Kingdom	487	328,000	388	264,000

Note—The capacity of all the blast furnaces in the country that could be blowing at one time, having regard to engine capacity, would thus be 13,728,000 tons per annum. It is practically impossible, however, for all these furnaces to be blowing at once, and the probable total effective capacity of the country is about 11 to 12 million tons per annum; the maximum output ever attained in the United Kingdom (1913) was 10,260,000 tons, and the output that would have been attained in 1920, if firms had produced throughout the year at the highest rate at which they produced in any month that year, was 9,926,000 tons.

ministration of the system of unemployment insurance has ensured that the depression has not been accompanied by the widespread distress and poverty of former times. Experience has shown that after most of the big wars supply was for a time in excess of the effective demand, and the question naturally arises how soon will effective demand again overtake supply after the late war? We have seen that, arguing from the rate of growth in the first decade of the twentieth century, the world ought now to be consuming some 105,000,000 tons of pig iron, but that the present rate of consumption is only 65,780,000 tons per annum. Potential demand must be even greater on account of the under-consumption of recent years and the fact that the production of the war years was so largely devoted to destructive purposes, but the question as to when the demand will become effective depends for its answer, as much upon political as upon economic considerations.

In spite of economic chaos on the Continent of Europe, considerable progress towards recovery has already been made, but before trade can resume its normal course confidence must be restored as the result of a settlement of the reparations problem. When these problems are settled, international exchange of commodities will grow to the proportions with which we were familiar before the war, and in the course of time will exceed them. This international exchange of commodities will require the services of British ships, which in itself will give a great fillip to the iron and steel industry. A special committee which met during the war to consider what would be the position of the shipbuilding industry after the war estimated that practically one-third of the output of British steelworks was consumed in the building or repairing of ships. The effect of the depression of the shipbuilding industry on the iron and steel industry is shown in Table VI.

New Ships To Be Built

The present mercantile marine of the world is more than sufficient for the present world's carrying trade, as is evident from the figures of idle tonnage (410,365 tons, of which 391,337 was laid upon British ports on April 1, 1924), and of ships in course of construction on which work has been suspended, but as soon as a trade revival justifies this course much of the present tonnage will be scrapped in favor of vessels which can be handled more economically, for one-third of the tonnage of the world is upwards of 15 years old, and about one-eighth is 25 years old. Another direction from which the demands for iron and steel should increase should be from our own Dominions, for although in the five years preceding the war the Dominions took 9,760,000 tons of iron and steel, in the five post-war years they have taken only 6,849,000 tons, and while the British iron and steel industry is watching with interest the efforts of many of the Dominions to create an iron and steel industry of their own, they anticipate that the development of the Dominions will be sufficiently rapid to absorb not only the home production, but also an increased import from the Mother Country. Since the British iron and steel industry exported approximately 50 per cent, of its products before the war, it follows that the increase in its capacity by 50 per cent gives an available surplus for export of two-thirds of its capacity, unless the home demand substantially increases.

As trade revives in the important textile and other industries of the country, it will be accompanied by increased calls on the engineering industry for machinery, and consequently on the iron and steel industry for increased quantities of iron and steel. At the same time the strength of our competitors must not be overlooked; though the iron and steel capacity of Belgium is no more than one-quarter of that of this country it is nevertheless a powerful competitor, for Belgium depends to an even greater extent than does Great Britain on export trade, and in competition with this country is favorably situated by reason of its low labor costs and the modern plant which has taken the place of the plant destroyed during the war. Further an active export policy is encouraged by the Belgian government which guarantees to Belgian exporters 55 per cent of the value of overseas contracts, so that in 1923, in spite of difficulties with regard to fuel owing to the Ruhr occupation, Belgium did a substantial export trade, and actually exported to Great Britain more iron and steel than before the war.

Before the war France scarcely counted as an exporter of iron and steel, her exports being but about one-tenth of the exports from this

Table IV

The World's Production of Pig Iron and Steel

Country	Production (in thousands of tons) 1913	1917	1920	1922	1923
Pig Iron					
U. S. A.	30,966	38,621	36,926	27,220	40,361
Great Britain	10,260	9,322	8,035	4,902	7,439
Germany	16,499	11,419	6,287	8,269	4,000
France	5,126	1,708	3,380	5,147	5,236
Belgium	2,446	8	1,099	1,588	2,149
Luxemburg	2,508	1,505	682	1,653	1,384
Italy	429	497	107	175	200
Spain	418	352	247	206	200
Sweden	732	843	477	271	350
Austria			96	318	335
Czecho-Slovakia	2,344	2,000	694	348	590
Hungary			30	246	295
Poland			100	458	492
Russia	4,486	1,500	113	200	315
Japan	56	121	168	300	300
China	...	...	...	400	375
India	204	252	312	340	450
Australia	47	148	344	84	300
Canada	1,015	1,086	999	402	909
Other countries*	200	100	181	100	100
Total	77,736	69,482	60,277	52,627	65,780
Steel Ingots and Castings					
U. S. A.	31,301	45,061	42,133	35,603	43,227
Great Britain	7,664	9,717	9,067	5,881	8,489
Germany	17,334	15,258	8,232	9,000	5,000
France	4,614	2,196	3,003	4,464	4,899
Belgium	2,428	9	1,233	1,540	2,234
Luxemburg	1,305	1,070	576	1,372	1,179
Italy	919	1,311	762	966	800
Spain	381	480	150	227	300
Sweden	582	572	430	306	400
Austria			195	478	482
Czecho-Slovakia	2,585	2,873	958	630	738
Hungary			40	150	344
Poland			60	930	935
Russia	4,760	2,000	45	215	492
Japan	14	364	308	500	500
China	...	...	...	150	150
India	...	164	156	150	200
Australia	...	151	167	100	200
Canada	1,043	1,562	1,110	481	885
Other countries*	100	410	151	100	100
Total	75,030	83,198	68,776	63,243	71,554

**IRON TRADE REVIEW*, January 5, 1924.

Table V

Production and Exports of Iron and Steel

Year	Production of Pig Iron tons	Production of Steel tons	Exports of iron and steel tons
1913	10,260,300	7,663,900	4,969,200
1919	7,398,000	7,894,000	2,232,800
1920	8,034,700	9,067,300	3,251,200
1921	2,616,300	3,703,400	1,696,900
1922	4,902,300	5,880,600	3,397,200
1923	7,438,500	8,488,900	4,319,600

country. Under the peace treaty, however France obtained the magnificently equipped iron and steel plants of Lorraine, which adds considerably to her capacity and renders it necessary that she should become a big exporter of iron and steel. That her exports have hitherto not been commensurate with her increased capacity is due firstly to the fact that much of her original plant in the North and East had been destroyed by the Germans, secondly that coal and coke on which the works in Lorraine are so largely dependent was not forthcoming from Germany under the terms of the peace treaty in sufficient quantities, and thirdly that the business of exporting iron and steel was to a large extent new to France. All these difficulties have now practically been overcome, and France will without doubt prove a strong competitor in foreign markets. The potentialities of German competition can perhaps best be envisaged from a consideration of the fact that to works the technical equipment of which is of an exceedingly high order there is added a low labor cost, owing to the fact that German industrialists have been able to impose upon their workpeople much longer hours with much lower wages than exist in this country. It is reported that in the German iron and steel industry a 60-hour week on night shifts, 58 hours on day shift and 57½ hours in finishing plants are being worked, while wages according to the agreement recently entered into between employers and workers, were as follows:

	Per hour pfennig	Approximate English equivalent d
Skilled workers	50	6
Semiskilled workers	45	5½
Assistants (male)	40	5
Assistants (female)	28	3½

It cannot be expected that such a low standard of living as is implied in these figures can be accepted for long, but until a substantial improvement in this direction takes place German competition will obviously, be difficult to meet.

American capacity was increased by 50 per cent, during the war, and although, owing to the fact that for the last year or two there has been a large home demand, the full force of America's competition has not been felt in overseas markets, there is no doubt that in times of restricted home demand America will endeavor to dispose of her surplus output in the export market and compete with the exports of Great Britain.

Industry Is Developing

In maintaining the high standard of efficiency and quality which characterized this industry in the past and to meet foreign competition the British industry is developing particularly fuel economy; industrial and commercial combination; decreased labor costs and research, technical education and education for works staffs.

The need for fuel economy requires no emphasis when it is remembered that about one-third of the cost of steel is attributable to fuel, and that coal prices are now about 89 per cent above pre-war, whereas iron and steel prices are only 47 per cent, and "general commodities" 65 per cent above. The fact that until comparatively recently Great Britain could obtain good coal at a moderate price may be responsible for the comparative neglect in the past of this subject. While any revolutionary scheme of bringing the older works up-to-date is out of the question at the present time, and therefore a gradual improvement only can be expected, recent work has shown that much can be done without too great a capital expenditure, provided that the industry pools the excellent technical resources and information available. In blast-furnace working, for instance, considerable possibilities probably exist in the preliminary treatment of the materials used, particularly of the coke.

Some of the modern systems of coal-washings also offer interesting possibilities of improving the chemical character of the coke, while preliminary treatment of the coal used for coking with new methods of coke manufacture likely to result from investigations now in progress will probably effect a considerable improvement in its physical character. Such methods with the gradual evolution of furnace design now taking place, many be expected ultimately to bring about a marked economy in fuel consumption and from large scale work now being conducted it seems reasonable to believe that substantial saving of fuel can be effected in this manner. On the steelmaking side the question of capital cost is not so serious as in blast-furnace practice, and a considerable saving can be effected by modernizing some of the older plants.

Industrial and commerical combination either in the horizontal direction (i.e. with firms producing the same

(*Concluded on Page* 1702)

Table VI

Vessel Tonnage Under Construction, Commenced and Launched 1920 to 1923

Quarter Ending	Tonnage of Vessels under Construction: Total	Tonnage of Vessels under Construction: On which work has been suspended	Tonnage Commenced	Tonnage Launched
1920:				
March 31	3,394,425	.....	708,031	454,294
June 30	3,578,153	.....	588,604	522,943
September 30	3,731,098	.....	593,821	483,057
December 31	3,708,916	.....	506,353	579,933
1921:				
March 31	3,798,593	497,000	392,877	433,607
June 30	3,530,047	735,000	69,028	321,690
September 30	3,282,972	731,000	51,343	307,850
December 31	2,640,319	722,000	55,290	467,246
1922:				
March 31	2,235,998	617,000	51,008	334,352
June 30	1,919,504	481,000	38,877	148,886
September 30	1,617,045	419,000	82,428	307,232
December 31	1,468,599	348,000	231,187	260,588
1923:				
March 31	1,492,138	181,000	355,203	228,371
June 30	1,337,759	130,000	241,283	239,373
September 30	1,271,195	242,000	111,860	66,474
December 31	1,395,181	164,000	244,506	114,583
1924:				
March 31	1,473,629	101,000	227,786	361,508

Finishing Steel Track Equipment

Railroad Frogs, Switches and Crossings Made from Cast Manganese Steel Require Considerable Grinding—Parts Straightened in Hydraulic Press—Swing Frame and Portable Grinders Play Important Part

BY FRED B. JACOBS

DUE to its wearing qualities, manganese steel is used extensively in the manufacture of rail frogs, switches and crossings. Such equipment is of two kinds inserted and solid. In inserted equipment, parts subjected to greatest wear consist of cast manganese steel inserts, but in the solid variety the entire unit is a manganese steel casting, which is finished entirely by grinding. While the grinding of frogs and switches is not a precision operation, care must be exercised to conform to dimensions, more or less exacting. At the plant of the Indianapolis Switch & Frog Co., Springfield, O., the output consists entirely of solid manganese steel frogs, switches and crossings. Preliminary to grinding various parts are straightened in a horizontal hydraulic press made by the company. It is capable of exerting a pressure of 350 tons. For finishing the end sections of frogs and switches a small wheel is used to get into corners. This operation is shown in Fig. 1. The portable grinder was made by the company. It is operated by a 3-horsepower motor. The wheel is driven by a long spindle housed in tube which forms a handle. The wheel is artificial alumina, 8 inches in diameter, 1¼-inch face, 16 grit, 1½ grade. As Fig. 1 shows, the work is conveniently mounted on a truck. Fig. 2 illustrates the method of grinding off a high section on the bottom of a frog. The machine used is a swing frame grinder made by the company, equipped with an artificial aluminum wheel 14 inches in diameter, 1¼-inch face, 16 grit, C grade or 16 grit, 1½ grade. This grinder is driven by a motor which developes 3 horsepower at 1700 revolutions per minute. The motor and grinder spindles are located at right angles. The motor is mounted back of the supporting yoke thereby counterbalancing the grinder. Power from the motor is transmitted through a shaft operating in a tube. The grinding wheel spindle is driven by a pair of miter gears housed in a dust-proof case packed with grease. This grinder also is used for fitting up the ends of the frog or switch to accommodate the fish plate. This operation technically is termed fishing.

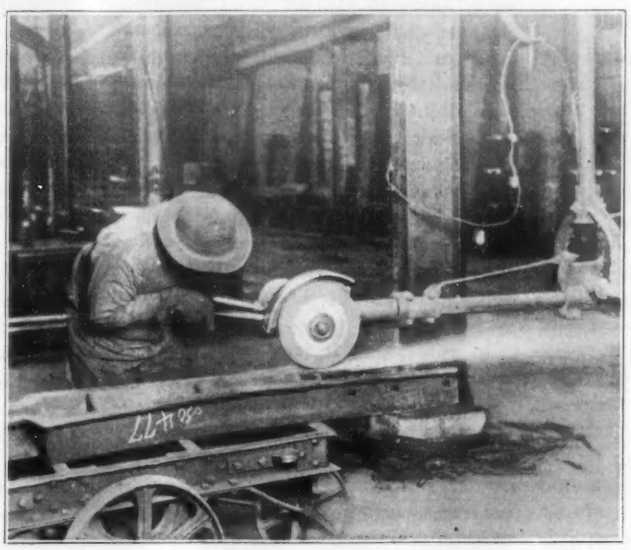


FIG. 2—FROG AND SWITCH BASES ARE GROUND UNDER ELECTRICALLY-DRIVEN SWING FRAME GRINDERS

In Fig. 3 a switch is shown mounted for surface grinding. This grinder is improvised from an openside planer built by Dietrick & Co., Baltimore. As the illustration shows, a grinding head is fitted to the cross rail saddle. The wheel is artificial alumina, 18 inches in diameter 3-inch face, 16 grit, G grade or 16 grit or 12-14-16 grit, 1¾ grade. The wheel is driven by a 15-horsepower motor, power being transmitted to the wheel spindle by a belt. The machine table is reciprocated at a speed of 20 feet per minute. It is operated by a worm drive, which is actuated by a 10-horsepower power motor. As the illustration shows, the work is strapped to the planer table. The wheel takes a cut approximately 1/16-inch deep. This

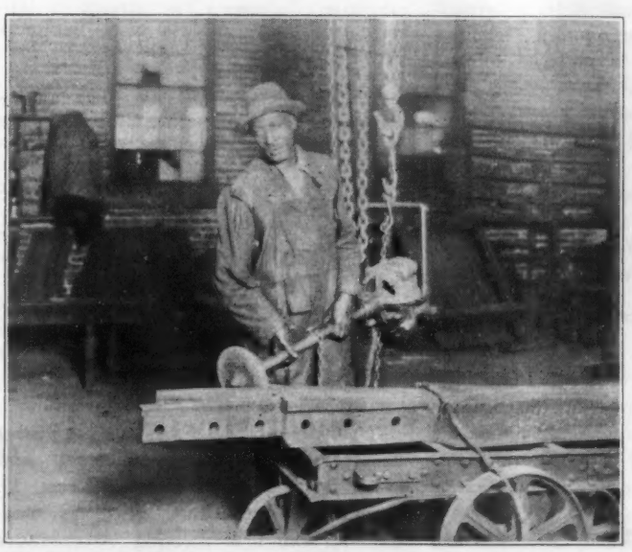


FIG. 1—PORTABLE GRINDERS ARE USED FOR FINISHING SECTIONS THAT CANNOT BE SURFACE GROUND

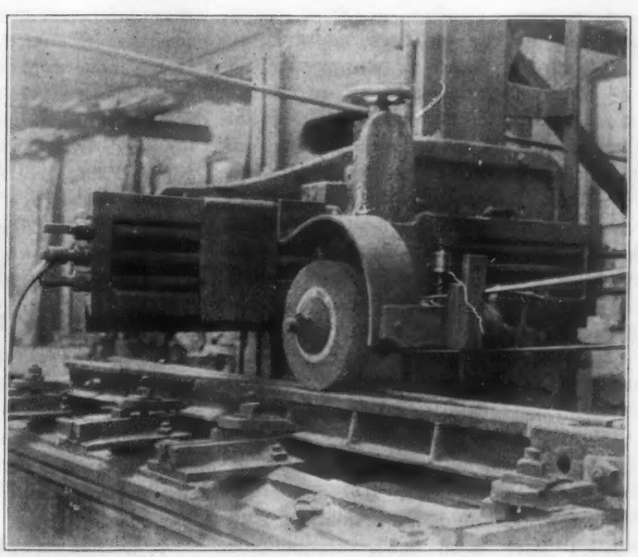


FIG. 3—A LARGE PLANER-TYPE GRINDER IS USED FOR SURFACING SWITCH AND FROG BASES

machine also is used for grinding out lines, or the grooves where the car wheel flanges ride. This operation is called line grinding and is performed after the parts are restraightened after surface grinding. Wheels used for line grinding seldom are over one inch face. The wheel face is rounded to fit the shape of the line. These wheels are the same grit and grade as used for surface grinding.

Another interesting operation consists of grinding out circular depressions in switch bases where the switch tongue fulcrums. This operation is performed under a drill press fitted with a special spindle and an artificial alumina cup wheel, 6 inches in diameter, 16 grit, P grade.

British Steel Industry Is Expanding

(*Concluded from Page* 1700)

products and having the same markets) or vertical direction (i.e. with firms controlling the constituent raw materials, coal, iron ore, etc., and for consuming the finished product of the iron and steel industry in shipbuilding, engineering, etc., has not yet proceeded so far in this country as in America or Germany, and obviously holds out many advantages.

The report of the Board of Trade committee which considered the position of the iron and steel trades after the war, recommended that an organization, co-operative in character, should be formed among British manufacturers for the purpose of obtaining adequate supplies of suitable iron ore and also that national selling organization should be formed for the purpose of marketing British iron and steel products in an efficient and economical manner. Neither of these recommendations has yet been adopted, but they clearly point to the possibilities of decreasing the cost of production by co-operative purchases and extending markets for iron and steel by co-operative selling. The success of the United States Products Co., of the Stahlwerksverband, and more recently of "Columeta," in improving the exports from their respective countries is probably too well known to need elaboration.

The relations between capital and labor in the iron and steel industry are probably more harmonious than those existing in any other industry. During many years there has been no serious strike nor lock-out in the industry, although unfortunately stoppages have been fairly frequent on account of disturbances in other industries on which iron and steel depends. The absence of labor troubles in the iron and steel industry is due in the main to the excellent network of machinery of conciliation boards and to the system of conciliation and sliding scales which have been in vogue for so many years. The governing feature of the conciliation machinery is the sliding scale, which is based upon the average ascertained selling price of a selected product so that wages vary according to the variation in the price of the product. Thus labor has taken its full share in the reduction of prices which the severe competition of recent years has forced the industry to accept. It is doubtful however whether the industry, can regain real prosperity without a further decrease in labor costs; this does not necessarily mean either increased hours or decreased earnings, but does imply that the output per man hour should be improved.

That the importance of research, technical education, and education for works staffs is recognized is abundantly evident from the activities of the Iron and Steel institute, the metallurgical departments of the universities, the various technical institutes in the iron and steelmaking districts, and the measures taken by the most progressive firms to educate their workers. Further developments in this direction may be expected.

In conclusion, it may be desirable to indicate some of the ways in which the Dominions can assist in the encouragement of the British iron and steel industry. The most obvious course is that of according a preference as regards customs duties on imports of iron and steel from Great Britain, and this preference is given in most cases, but there are other and less obvious ways in which this assistance may be given, the two chief of which are the insistence of equally stringent tests being applied to material offered from other sources at lower prices than British steel as is applied to material supplied from Great Britain, and secondly that as far as possible the clauses insisting on fair wages and conditions of labor shall be as strictly applied to imports from the Continent as to the imports from Great Britain.

Buy From Mother Country

These notes, briefly describing the present stage of development and the effect of war demands on the British iron and steel industry, will sufficiently indicate its potential capacity for meeting the requirements of the Dominions overseas.

It will be recognized by all concerned that in the development and expansion of the Dominions great demands for iron and steel must arise, and if, as is confidently hoped and anticipated, this development increases rapidly in the immediate future, such demands must of necessity far outstrip the capacity of the domestic iron and steel industries in the Dominions, in which case a determined effort should be made by the British industry and the Dominions to ensure that all demands of the Empire are met from the resources of the Empire.

New Type Ladle Nozzle Is Developed

Exclusive rights to manufacture in graphite a new design of nozzle for bottom pour ladles have been granted the Ross Tacony Crucible Co., Philadelphia. The design is covered by patent No. 1,426,136 held by W. H. Wills, the Atlas Steel Corp., Dunkirk N. Y. A feature of the nozzle is the shape of the hole through the nozzle brick which is derived from that of the compound tube used in hydraulics. This type of tube for discharging water is one which converges to the minimum diameter, continues cylindrical for a short distance, then gradually diverges.

Under proper conditions of pressure a discharge of a considerable larger volume can be obtained than through a tube with parallel walls. Where the coefficient discharge of the latter is less than 1.00, the coefficient of the former may be in some cases over 2.00. With heavy liquids, such as molten metals, the greater pressures would offset this larger coefficient to some extent. Advantages claimed with a nozzle of this design follow:

1. A slightly larger volume of metal can be poured through this type than through a cylindrical one of the same minimum diameter. The stream is uniform and there is less of a tendency to spray, especially with partial openings of the stopper.

2. The tendency to freeze up in case the metal is not superheated sufficiently is lessened due to the short length of the least diameter compared to the cylindrical type and to the divergence of the lower part.

3. The divergence feature facilitates reopening the nozzle in case of a freeze up.

4. It can be produced at low cost and substituted for the present standard nozzle without material change in the ladle.

Creditors of J. F. Davis & Sons Co., DePere, Wis., structural and boiler works, have elected Lynn D. Joseph of Green Bay, Wis., as trustee. At the first meeting 90 creditors with claims of more than $210,000 appeared.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

H L. SCHRECK, for a number of years general engineer for the Wheeling Steel Corp., Wheeling, W. Va., has resigned and will be succeeded by William J. Stoop who has had general charge of plant operations. Mr. Scheck joined the Wheeling corporation from Mackintosh-Hemphill Co., going to the plant at Portsmouth, O., of the Whitaker-Glessner Co., subsidiary of the Wheeling Steel Corp. Andrew Glass, as previously announced, is returning to the Wheeling corporation as vice president in charge of operations, from which position he resigned several years ago. He formerly was in charge of the plant at Portsmouth, O. and later was president of the Whitaker-Glessner Co.

C. K. Wehn, in charge of sales of standard steel buildings for the Blaw-Knox Co., Pittsburgh, in that district, has been made assistant sales manager of the standard building department, in addition to his present duties.

* * *

Col. Elmer H. Havens, Bridgeport Conn., former president of the Locomobile Co., has been elected president of the Norwalk Co., Norwalk, Conn. He was receiver for the old company, the Norwalk Iron Works which the Norwalk Co. succeeded.

* * *

J. S. Lockhead, resigned recently as superintendent of the South Side plant, Pittsburgh, of the Jones & Laughlin Steel Corp. No successor has been appointed.

* * *

William G. Pearce, vice chairman, American Brake Shoe & Foundry Co., New York, is in London where he arrived following a tour of North Africa and the Mediterranean.

* * *

Claude S. Briggs, formerly attached to the C. R. Wilson Body Co., Detroit, has joined the American Auto Body Trimming Co., that city and will assist in designing bodies for trucks.

* * *

G. S. Brush has been elected vice president of the Ballard Oil Burning Equipment Co. with headquarters at Boston. He also has charge of the New England interests of the Ballard Fuel Oil Terminal Corp.

* * *

John H. McCartney, formerly New York representative of the Standard Tank Car Co., Sharon, Pa., has been appointed eastern representative of the Youngstown Steel Car Co., Niles, O., with offices in New York.

* * *

D. S. Faulkner, recently elected president of the Union Tool Co., New York, to succeed P. M. Roggs who became chairman of the board, formerly was vice president and manager of the eastern division for that company which is operated as a subsidiary of the National Supply Co.

* * *

K. A. Hills, since January attached to the sales office at Davenport, Ia., of the General Electric Co., was recently made manager of that office, covering a territory including a large part of the state of Iowa. Mr. Hills has been connected with the General Electric Co. since May, 1910.

S. E. Gates, for 14 years in charge of the Spokane office, has been appointed manager of the Los Angeles office of the General Electric Co. Mr. Bernhard Olsen, for 12 years employed in the Spokane office, has been appointed manager of that office succeeding Mr. Gates.

* * *

Harvey T. Gracely, recently made assistant sales manager of the Marion Steam Shovel Co., Marion, O., builder of shovels, excavators, dredges, cranes, etc., formerly served as advertising manager.

Clarence E. Silva, formerly in the engineering department of the Marion company, has been advanced to fill the position vacated by Mr. Gracely.

* * *

A. J. Jupp, vice president of the Lunkenheimer Co., Cincinnati, sailed June 20, on the SCYTHIA, to represent Cincinnati at the World Power conference which convenes in London, England, June 30. Mr. Jupp will explain the relation of valves and pipe fittings in the control of gases, liquids, steam and water.

* * *

H. G. Dalton, a member of Pickands, Mather & Co., Cleveland, iron ore and vessel interest, has donated funds to Kenyon college, Gambier, O., for the construction of a science hall. The building is to be named Mather Science hall, in honor of Samuel Mather, of Pickands, Mather & Co. Mr. Mather has been one of the greatest benefactors of the Ohio college having donated large sums of money for buildings and other improvements.

* * *

Fred D. Sweet, formerly with the Biflex Corp., Waukegan, Ill., manufacturer of automobile bumpers, has bought an interest in the Steel Products Corp., Sheboygan, Wis., and has been elected secretary, also becoming sales manager. The Sheboygan company was incorporated recently for $100,000 to take over the automobile bumper and specialty department of the Jenkins Machine Co., Sheboygan.

* * *

C. D. Claney, secretary of the Superior Steel Corp., Pittsburgh and Carnegie, Pa., strip steel manufacturer, and assistant treasurer since May of this year, has been re-elected secretary and has been elected treasurer, to succeed C. H. Forster who resigned in May to become affiliated with the Morris & Bailey division of the Oliver Iron & Steel Co. Mr. Claney, between 1900 and 1922, was affiliated with the Crucible Steel Co. of America, or ever since its formation, recently as assistant general sales agent at Pittsburgh. In 1922 he became identified with the Superior Steel Corp. as secretary and treasurer and at its re-organization in 1923 he resigned as treasurer, becoming secretary of the re-organized company.

* * *

Fitch H. Beach, Beach Mfg. Co., Charlotte, Mich., manufacturer of road building equipment and supplies, has donated to the city of Charlotte a large brick community market house.

* * *

R. R. Smith has been appointed sales metallurgist of the United Alloy Steel Corp., Canton, O., with his headquarters in the Chicago office. His connection with the company became effective June 15. Mr. Smith was with the United organization from 1916 to 1920 when he left to join Robert H. Hassler, Inc., Indianapolis, Ind., manufacturer of shock absorbers, as metallurgist. L. K. Townsend is district sales manager at Chicago of the United Alloy Steel Corp.

Industrial employment in this city for the week ended June 17, as represented by the Employers' association totaled 202,153, a decrease of 2058 from the previous week. It is the smallest decline since April 22.

British Foundrymen Hold Meet

Close Friendship Between British and American Associations Again Expressed at Annual Convention at Newcastle—Many Technical Papers Presented —American Exchange Paper Received with Much Appreciation

NEWCASTLE-ON-TYNE, England, June 7.—The close bond existing between the American and British foundry industries again was emphasized at the twenty-first annual convention of the Institute of British Foundrymen, held in Newcastle, June 4-6. At the opening session a cablegram of fraternal greetings from G. H. Clamer, president of the American Foundrymen's association, was read. H. D. Miles, Buffalo Foundry & Machine Co., Buffalo, N. Y., attended the meeting as an official representative of the American association. In an address which he made on Thursday, June 6, he read the text of the illuminated address which is being prepared for the Institute of British Foundrymen in appreciation of the welcome which the American delegation received while it was in England last year. Mr. Miles, who is a past president of the American Foundrymen's association also commented on the great practical and technical value of the exhibitions of foundry supplies and equipment which are held in America annually. The annual exchange paper from the American Foundrymen's association was received with acclaim. It was pointed out that this arrangement for exchanging practical information on foundry subjects between the two countries is now in its fourth year. This year the Institute of British Foundrymen will contribute a paper at the Milwaukee meeting on bell founding, a subject concerning which little is in print.

A paper was presented at the Newcastle convention on behalf of the French Foundrymen's association. Telegraph greetings were received from the Italian Foundrymen's association. The Dutch organization of foundrymen was represented by Count A. E. Boddaert, Middleburg, Holland, and A. Van Aarst, foundry proprietor, Weert, Holland.

Shaw Receives Medal

Following the opening ceremonies on June 4, the Oliver Stubbs gold medal, which is awarded annually for distinctive service to the British foundry industry, was presented to John Shaw, foundry manager, Brightside Foundry & Engineering Co. Ltd., Sheffield. Mr. Shaw is one of the founders of the Institute of British Foundrymen. He is its representative on the international committee which is studying the question of uniform tests for cast iron.

Just before he retired from the chair, Oliver Stubbs, who has twice been president since 1920, was unanimously elected a special honorary member for life. The results of the election of officers for the ensuing year, 1924-5, as shown in the accompanying box, having been announced, the new president, R. O. Patterson, manager director, Smith Patterson & Co. Ltd., Blaydon-on-Tyne, was installed in office. In his presidential address. Mr. Patterson pointed out the necessity for commercial research in order to broaden the markets for castings and traced comprehensively some of the recent technical achievements of British foundrymen. In the report of the council it was stated that the Institute of British Foundrymen now has 1556 members, the Lancashire branch being the largest with 279.

The first paper on the program, read by L. Northcott, University of Birmingham, dealt with "The Formation of Graphite in Cast Iron." The paper embodied the results of laboratory experiments on specimens of both malleable iron and ordinary gray iron. Opening the discussion, John Shaw, Sheffield, pointed out that the formation of graphite is a function of both time and temperature; nothing is served by holding the metal for a period of time at a uniform temperature. H. J. Young, Northeastern Marine Engineering Co., Wallsend-on-Tyne, criticized the paper on the ground that the experiments on which the author based his conclusions were on such a small scale as to vitiate their practical value. The author, he also said, used an iron with uncommonly low total carbon, most British pig iron being considerably in excess of 3.2 per cent. The author in his reply denied that graphite can exist in molten iron and defended the utility of his experiments.

New Officers

President
ROBERT O. PATTERSON
Smith Patterson & Co., Ltd., Blaydon-on-Tyne

Senior Vice President
J. CAMERON
Cameron & Roberton, Ltd., Kirkintilloch, Scotland

Junior Vice President
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The A. F. A. Exchange Paper

In the absence of the authors, the annual exchange paper from the American Foundrymen's association, by Robert J. Anderson, consulting foundry engineer, Boston, and M. Edward Boyd, entitled, "The Production of Castings in Permanent Molds," was read in abstract by H. Cole Estep, European manager of IRON TRADE REVIEW. The principal features of the paper were pointed out and reference was made to the antiquity of the permanent mold process.

A paper describing continental European cupola practice was read by A. Van Aarst on behalf of the author, H. Van Aart, a prominent Dutch gray-iron foundryman.

At the second session which took place Thursday morning, June 5, Oliver Stubbs, past president, referred to the appreciation of British foundrymen of the work which has been done in the past four years by H. Cole Estep as chairman of the committee on international relations of the American Foundrymen's association and expressed the regret of the Institute of British Foundrymen on learning that Mr. Estep will return to the United States. These remarks were seconded by Col. W. F. Cheesewright, publisher *The Iron & Coal Trades Review*, London.

The technical sessions were then continued with the reading of a paper by A. E. Logan, R. & W. Hawthorne, Leslie & Co, Ltd., Newcastle, on "Nonferrous Alloys in Marine Engineering—With Special Reference to Admiralty Gunmetal, Manganese Brass, and White Metals." The paper was illustrated by lantern slides. After dealing with the metallography of various nonferrous metals and bearing bronzes the paper describes the methods used by the author to produce sound castings. For certain large marine-engine brasses the author of recommends bottom pouring using a special rig for this purpose.

Although the author said he could not recommend it, F. J. Cook stated that for bearings up to 13 inches in diameter, water cooling during casting is beneficial, assisting in the formation of the desirable

(*Concluded on Page* 1706)

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Norwalk Iron Works, Norwalk, Conn., recently sold at public auction, has been purchased by Stanley & Bissell, Cleveland banking interests, and the company reorganized under the name of Norwalk Co. E. H. Havens, Bridgeport, Conn., has been elected president; F. R. Hickman, also of Bridgeport, vice president and treasurer, and R. C. Witmer as secretary. The new board of directors is as follows: The officers just mentioned and Charles B. Stanley, Howard N. Bissel, George F. Griffith of Cleveland, and T. H. Hermanson of Norwalk. The company builds air compressors and other similar equipment. A machine manufactured by the company is used to pump helium gas into dirigibles at the Lakehurst, N. J., plant of the United States air service.

The Norwalk plant was begun in 1867 when the original Norwalk Iron Works Co. was incorporated. The new company plans generally broadening the output of the plant to include a complete range of air and gas compressors.

* * *

HUNTER PRESSED STEEL CO., Lansdale, Pa., has opened a spring department for the manufacture of wire coil springs of all sizes and types. The department is a complete plant with modern high speed machines and experienced operatives.

* * *

PACIFIC Foundry Co., Tacoma, Wash., has taken up its operations at 1001 East D street, following the fire which damaged the plant at 1113 St. Paul avenue. A plant was constructed at the new address and modern equipment installed.

* * *

CHARTER GAS ENGINE CO., Sterling, Ill., is having plans prepared by Frank D. Chase, Inc., 720 North Michigan boulevard, Chicago, for a new gas engine plant, including machine shop, foundry and warehouse buildings to be constructed at Sterling.

* * *

A LARGE order for parts of oil engines for a new rum chaser fleet being built for the government has been placed with the Automotive Foundry Co., LaCrosse, Wis. This will not only keep the greater part of the plant at capacity operations but makes it necessary to take over the gray iron foundry of the former LaCrosse Tractor Co., which has been idle three years. The order is valued at $400,000 and will require about four months to fill.

* * *

TROY COKE & IRON CO., recently organized to rebuild the old blast furnace of the Burden Iron Co. at Troy, N. Y., and to erect a by-product coke oven plant, has signed a 20-year contract to supply gas to the Adirondack Power & Light Corp. The gas will go into a central system which will supply Albany, Troy and Schenectady.

* * *

H O. SWOBODA, INC., Empire building, Pittsburgh, consulting electrical and mechanical engineer, has been retained by the Fostoria Glass Co., Moundsville, W. Va., to make improvements to its power plant including installation of a new generating unit. Plans and specifications will be completed shortly.

* * *

NATIONAL ELECTRIC STEEL CASTINGS CO., Cleveland, recently was incorporated with $100,000 capital stock to operate a foundry. John C. Barkley and John P. Sturges, of Frank P. Quail, National City building, attorney, are representing the principals in the transactions. A plant is to be leased and operations begun shortly.

* * *

INSTALLATION of a brake beam department for the manufacture of brake beams, has been announced by the Chicago Malleable Castings Co., West Pullman, Chicago. The new department will be under the supervision of James H. Slawson, formerly vice president and general manager of the Joilet Railway Supply Co. Mr. Slawson will be located at 435 Railway Exchange building, Chicago.

* * *

HANFORD FOUNDRY, Hanford, Cal., recently purchased by P. J. Fasullo, formerly connected with the Best Steel Casting Co., Oakland, Cal., is installing a compressor, a jarring machine, a combined jar roll over machine, and a furnace for melting brass. The company will manufacture piston rings and do general jobbing in gray iron, brass and aluminum foundry work.

* * *

WH. DONAHUE recently was elected president of the Beggs Machine & Supply Co, Beggs, Okla. Mrs. Margaret Purnell, widow of the founder of the company, was made vice president and general manager. R. C. Patton also was elected vice president and Mrs. Purnell again was chosen secretary and treasurer.

* * *

FOLLOWING the acquisition by the Stoughton Wagon Co., Stoughton, Wis., of the tools and production rights of two types of motor truck engines from the Midwest Engine Co., Indianapolis, two executives of the Midwest company have made connections with the Stoughton company. They are K. C. Plasterer, works manager, and W. C. Buser, assistant sales manager. The purchase included parts and materials for about 500 motors.

* * *

DIRECTORS of Burroughs Adding Machine Co., Detroit, have submitted a plan to stockholders for a reorganization of the company. It is proposed that $30,000,000 common stock, par value $100, be replaced by $15,000,000 preferred 7 per cent, par value $100 and 600,000 shares of no par value common stock. For each share of stock now held the stockholders would receive one half share of preferred stock and two shares of no par value common stock of the new company. It is proposed also to discontinue the present corporation and re-incorporate for a period of 30 years. The stockholders have been asked to vote on the proposals June 26 and 28.

* * *

JAMES C. MERVIN, works manager of the Chain Belt Co., Milwaukee, manufacturer of concrete mixers, water screens, conveyors, etc., was elected second vice president at the annual meeting of the company held recently. Mr. Merwin was graduated from Sheffield scientific school, Yale university in 1910 and has been connected with the company since 1917. Brinton Welser, graduate of the University of Wisconsin in 1912 and since then connected with the Chain Belt Co. was elected secretary, and C. E. Stone, assistant secretary. Mr. Stone, who also is assistant to the president and since 1918 purchasing agent, was graduated from the University of Michigan in 1910. Officers re-elected were C. R. Messinger, president; Clifford F. Messinger, first vice president, and C. L. Pfeifer, treasurer.

British Foundrymen Meet

(*Concluded from Page* 1704)

tin-antimony cubes. For this purpose arrangements are made so that the water rises around the mold simultaneously with the metal in the mold.

A paper dealing with the thermal analysis of cast iron from the standpoint of pure science, with notes on its practical application, was read on behalf of the Association Technique de Fonderie de France by Pierre Chevenard, professor of metallurgy at the St. Ettienne school of Mines. This paper was illustrated by lantern slides.

The technical sessions were concluded with a paper entitled "The Technical Side of Oil-Sand Cores," by C. W. H. Holmes, Birtley Iron Co., Birtley. The discussion emphasized the fact that oil-sand cores may be used with heavy metal sections. Oliver Stubbs mentioned a 22-ton casting with metal sections of 9 inches in which oil-sand cores were used exclusively. This was confirmed by other speakers, although the author was not disposed to recommend such cores where the metal section exceeds 2½ inches.

The arrangements of the Newcastle reception committee for the entertainment of the visitors were unusually complete. In addition to the annual banquet, a luncheon was given on Friday, June 6.

The guests were tendered a civic welcome by the Lord Mayor of Newcastle, Stephen Easten, at Jesmond Dene on Thursday afternoon, June 5. A theater party was held the same evening. On Friday the arrangements were concluded with an automobile drive to Rothbury and a sail down the Tyne on the steamer SIR WILLIAM STEPHENSON. The ladies were specially entertained with an automobile drive to Whitley bay and a luncheon at which they were welcomed by the Lady Mayoress.

Among the numerous plants in the vicinity of Newcastle which were visited by parties of foundrymen during the convention were: Wallsend Slipway & Engineering Co.; C. A. Parsons & Co. Ltd.; Northeastern Marine Engineering Co. Ltd.; Smith Patterson & Co. Ltd.; Sir W. G. Armstrong, Whitworth & Co. Ltd.; and C. T. Maling & Sons.

Expands Wire Plant

Chicago, June 24.—The Chicago Steel & Wire Co., South Chicago, Ill., is now completing the first series of units of its expansion program, including a fine wire cleaning department, dry wire mill, annealing building, tinning room and boiler house. New transformer vaults also have been added. It is expected that the extensions will triple the present capacity of 5000 tons of manufacturer's wire annually.

Obituaries

WILLIAM A. FIELD, for 13 years superintendent of the South Works of the Illinois Steel Co., South Chicago, Ill., long prominent as an operating executive in the steel industry, and lately president of William A. Field & Co., Chicago, electrotypers and engravers, died at his home in Chicago, June 22, from inhaling gas. Mr. Field was born in Dixon Springs near Nashville, Tenn., in 1869, and was graduated from the

WILLIAM A. FIELD

Stevens Institute of Technology in 1891. In August of the latter year he obtained his first connection with the Illinois Steel Co., as a straw boss at the South Works. In July, 1903, he was promoted to the position of general superintendent of the South Works. In 1917 he left the Illinois Steel Co. to take charge of the United Alloy Steel Co., Canton, O., from which he severed his connection to join the ordnance department at Washington, during the war. After the war he went with the Matthiessen & Hegeler Zinc Co., La Salle, Ill. He returned to Chicago from that connection where he formed the William A. Field & Co.

* * *

Benjamin Fletcher Miles, former president of the Browning Engineering Co., Cleveland, died June 30 at his home at that city. He was born in New York and went to Cleveland soon after graduating from the University of Rochester, in 1881. Mr. Miles first was connected with Tod-Stambaugh Co., Cleveland, iron ore operators, and later was president of the American Linseed Co., president of the Western Banknote Co., a founder of the National Carbon Co., and president of the Browning Engineering Co. He was retired at the time of his death.

* * *

John K. Petty, secretary and treasurer of the J. K. Petty Co. Philadelphia, which operates the Lebanon Boiler Works, Lebanon, Pa., died June 17, at his home in Germantown, Pa.

* * *

Charles Eperson Cox, formerly manufacturer of agricultural implements with office at Quincy, Ill., died June 20 at the home of relatives in Elizabeth, N. J. Mr. Cox was 91. He was the father-in-law of Frank A. Vanderlip, New York banker.

* * *

Albert Carr, for many years consulting engineer of the Interborough Rapid Transit Co., New York, and who was one of the engineers in charge of the rebuilding of San Francisco after the earthquake, died June 18 at his home in East Orange, N. J. aged 65. Mr Carr planned the transit system at Buenos Aires. He also took an important part in the construction of subways in New York.

* * *

James White, treasurer and senior member of Patrick White & Sons, Perth Amboy, N. J., founders and machinists, died of heart failure, June 16, in the Jersey Central station at Jersey City, N. J., aged 59 years. He was born in Newark, N. J., but at the age of four, moved with his family to Perth Amboy, where he resided until his death. Upon completing his education at Packard institute, New York, he immediately became affiliated with the White foundry, established by his father in 1872. His successor has not as yet been appointed.

Reports from the 11 principal foundry centers show there were no changes in wages of union molders and coremakers during June. The strike in the Newark, N. J., district was settled in April, terms having been arrived at $7.50 per day of eight hours. The strike was for an advance from 90 cents to $1 an hour.

Machine Tool Buying Still Quiet

Inquiry Continues Spotty and Scattered—Few Sales of Large Size Are Closed—Export Demand Improves With Japanese Inquiry a Feature—Used Equipment Market Lacks Steady Strength—Crane Buying Is Slow

MACHINE tool buying continues quiet with few orders of importance being closed. Inquiries are scattered and relatively few. The export market has gained strength, especially as reported by New England manufacturers. The leading inquiry continues that for the Shibaura Engineering Works, Japan, for which General Electric Co. is acting as advisor. This list now totals close to 100 items. Additional tools are expected to be added shortly.

Railroad buying still is delayed, with little action in that quarter. The Burlington has enlarged its list but is not closing against it with any dispatch. The Pennsylvania and the Lehigh Valley are in the market for equipment, the latter for eight tools. Southern railroad continues to place orders against its list for Birmingham, Ala.

Used equipment demand lacks steady strength, the activity of May having decreased considerably in the last few weeks. Used tools still are moving at a fair rate when compared with new machinery sales. Auction sales of industrial plants are slowing used equipment demand.

Little activity is noted among crane interests, although many inquiries of good size are pending. Awards continue few and scattered, with that of the Westinghouse Electric & Mfg. Co. for 10 as a feature.

Many Railroad Orders In Sight But Few Closed

NEW YORK, June 24.—Of prime interest in the local machine tool market is the steadily increasing list for the Shibaura Engineering Works, Japan. Although not definitely ascertained, it appears that machines actually on inquiry number close to 100. Within the past few days, 12 lathes, eight millers, five die sinkers, a radial drill and several other items have been issued. As noted in a recent issue, these inquiries are being issued by the General Electric Co., Schenectady, N. Y., which is serving in an advisory capacity to Mitsui & Co., Ltd., 65 Broadway, who it is understood, actually will place the business. Additional inquiries are expected out shortly.

Domestic inquiry is spotty and includes eight machine tools for the Lehigh Valley railroad, for installation at their shops at Sayre, Pa., Cortland, N. Y., and Auburn N. Y. The Pennsylvania railroad has recently come into the market for a car wheel lathe, boring mill and a pipe machine. Some school work also is pending in this district, including approximately 15 machines tools for a school in Jersey City. The New York school board is reported to have closed on four or five machines, including two lathes. The Southern railroad continues to place orders against its recent list of 18 machines for Birmingham, Ala. The latest orders include a 50-ton hydraulic press, flue cleaner a radial drill, and it is understood two lathes.

Crane buying is slow, this being particularly noticeable with regard to locomotive cranes. During the past week, only one locomotive crane sale was reported in this district. A fair number of inquiries are pending, but orders are coming through slowly.

While foundry equipment buying as a whole in the eastern district is far from brisk, the slight improvement noted recently is at least being maintained. There are few new projects or additions; but the restricted operations ot the majority of foundries is giving operators an oportunity to make repairs and alterations and apparently this is the chief factor.

Market Quietness Grows

CLEVELAND, June 24.—Quietness in the machinery market continues to grow more evident. Inquiries are scarcer with few being for more than one machine each. Small tools are moving fairly well but few large ones are being purchased. One manufacturer reports the last few weeks as the dullest in a year. There seems to be a tendency among consumers to get ready to buy, regarded by some as an encouraging feature. The Atlas Car & Foundry Co., is in the market for an 84-inch planer and a 10-inch capacity cold saw.

One dealer reports no let up in business, having shipped five or six tools to an interest in Wisconsin, including a 20-foot lathe. Another purchaser closed with that dealer for 15 tools, five of which were new, but all were small. A large electric grinder was purchased by the municipality of East Cleveland. Another dealer sold a few radial drills.

Used equipment continues to move as fast as new tools, but is not up to the rate of May. Prices of used tools are not strong, but shading is no more prevalent than in the last few weeks. Crane builders are not booking many orders, but are operating at a high enough rate to make price concessions few. Several northern Ohio builders recently have been cutting from 10 to 20 per cent off list prices when occasions warranted to book specific contracts, but this weakness in quotations is not general.

Some Larger Orders Placed

PITTSBURGH, June 24.—Another quiet week has been passed by the machine tool and equipment sellers in the Pittsburgh area. Occasionally a transaction stands out from the regular run of business but these are rare. The usual orders are for single tools and while a number of inquiries still are pending, some of these do not give promise of early closing. As noted last week, the American Bridge Co. has closed on its special radial drills needed in fabrication of steel for the Philadelphia-Camden bridge, the Motch & Merryweather Machinery Co., receiving an order for five 6-foot radial drills. In the used machinery market, a fair number of single installations are being closed; some entirely on price, that is the manufacturers do not actually need the machinery but because attractive figures are quoted they purchase the tools. This branch of the trade is feeling the effects of the numerous auction sales of plant equipment throughout the country which are attended in large part by the machinery users themselves. Some of these manufacturers are buying up machinery at attractive figures to be offered for sale later when the market has improved. The board of education has practically completed its purchases for

the various trade schools in this district, and about the only large inquiries pending are those of the Carnegie Steel Co., Westinghouse Electric & Mfg. Co., and one or two others referred to lately.

In foundry equipment, a fair degree of activity is enjoyed each month. Recent purchasers of molding machines include the Kensington-Davis Corp., Buffalo, six large molding machines from the Herman-Pneumatic Machine Co. This interest also sold two each to the Ohio Steel Foundry Co., Springfield, O., and the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., and one each to the Standard Sanitary Mfg. Co., New Brighton, Pa., and the Raritan Foundry Co., Raritan, N. J. The Allegheny Steel Co., Brackenridge, Pa., and the Pittsburgh Gray Iron Foundry Co., Pittsburgh, each bought core ovens, and the Canton Malleable Iron Co., Canton, O., bought a sand mixer.

Crane orders are scarce this week although the Westinghouse Electric & Mfg. Co. has wound up its crane purchases for the time being for its Sharon, Pa., transformer plant, taking three from a Michigan manufacturer and two from an Illinois builder. Several crane orders are expected to be placed this week, including the Westinghouse Airbake Co., and the Carnegie Steel Co.

Burlington Enlarges List

CHICAGO, June 24.—The Chicago, Burlington & Quincy railroad, which already has a list out, has added to its wants two dry grinders, one band resaw and scroll, one 3 x 36 x 17-inch flat turret lathe for railroad work equipped with automatic die and chucking outfits and one ball bearing band saw with guide attachment. Some local dealers are doubtful whether the Santa Fe railroad will place at this time all of the tools it has planned to buy for its San Bernardino, Cal., shops. Most machinery houses have found June a much slower month than May. In many instances prospective buyers have been able to meet their needs with used machinery. Less inquiry appears to be out than at any time in many weeks.

Business Continues Spotty

CINCINNATI, June 24.—Business in machine tools continues spotty, with some dealers reporting slight improvement and others unable to see any deviation from the low level of activity that has prevailed. Automobile interests are still the best buyers and have recently increased their orders, although in no case have any large lots been placed in this market. Railroad buying remains disappointing with but few orders received. General industrial demand is only fair and confined largely to replacements. There is a much used machinery on the market which buyers say they can get at such a substantial reduction compared with new, usefulness being about equal, that they prefer the used. The bulk of the machinery and equipment of the Cincinnati Screw Co. which was sold at auction June 19, was purchased by used tool dealers. A majority of the machine tool building plants in this locality are operating on a part time basis.

EXPORT DEMAND IMPROVES

BOSTON, June 24.—Sales of new machine tools at Boston during the past week have been about as few as at any time during the year and the sentiment among New England dealers generally is far from cheerful. Among machine tool builders, on the other hand, a new note of encouragement is apparent. Several New England manufacturers report a definite improvement in export orders coupled with stabilized, although low, domestic demand. In such cases production for export represents an increase in plant output. A manufacturer of special grinding tools reports an improvement in domestic orders, the principal demand coming from middle western states. Sales in New England have been few and mainly for single tools. One dealer reports having sold a special purpose tool valued at approximately $5000. Inquiry is quiet but several projects of size involving special equipment are under negotiation. The used tool market continues without appreciable change. Prices are soft in the case of standard types of used machines.

Crane Awards and Inquiries of the Week

Orders Placed

Two 5-ton electric cranes, 50-foot span for the Westinghouse Electric & Mfg. Co., Pittsburgh, to the Whiting Corp.

Five steel derricks for maneuver boats, United States engineers, Louisville, Ky., to the American Hoist & Derrick Co.

Four 10-ton cranes to road contractors and sand and gravel interests, to McMyler-Interstate Co.

Three 3-ton cranes for the Westinghouse Electric & Mfg. Co., Sharon, Pa., to the Northern Engineering Works.

Single Installations

25-ton locomotive crane for a steel and iron company, to the Ohio Locomotive Crane Co.

30-ton crane for a contracting company in northern Ohio, to the Ohio Locomotive Crane Co.

3-ton, two motor monorail hoist for single line bucket to handle coal and other material for the Cottage Plaining Mill Co., Everett, Pa., to the Euclid Crane & Hoist Co., through the Factory Products Co., Pittsburgh.

5-ton handpower crane, 45-foot span to the Youngstown Sheet & Tube Co., Youngstown, O., to the Whiting Corp.

10-ton electric crane, 80-foot span for the Chicago, Burlington & Quincy railroad, to the Whiting Corp.

5-ton used hand-power traveling crane, built by the Whiting Corp., to the Specialty Foundry Co., Ellwood City, Pa., sold by J. S. McCormick Co., Pittsburgh.

10-ton crawler crane for the A. G. Rothey Co., Monongahela City, Pa., awarded the McMyler-Interstate Co.

2-yard, 4-motor electric crane, 92-foot 6-inch span, for the United States Metals Refining Co., Carteret, N. J., to the Shepard Electric Crane & Hoist Co.

20-ton crane for a railroad, to McMyler-Interstate Co.

½-yard electric overhead bucket handling crane, 35-foot 8-inch span, through Abbott Merct, consulting engineer, Fifth avenue, New York, for the Mortor Supply Co., that city, to the Milwaukee Electric Crane & Mfg. Co.

1½-yard, 4-motor, bucket handling crane for the Indiana Light & Power Co., placed by Stone & Webster, Boston, consulting engineers, with the Whiting Corp.

10-ton gantry crane for the Melrose yards of the New York Central railroad in the Bronx, New York, to the Cleveland Electric Crane & Mfg. Co.

Wrecking crane for the Czarnikow & Rionda Co., 112 Wall street, New York, for shipment to Cuba, reported placed with Industrial Works.

Orders Pending

Nine cranes for the National Tube Co., Gary works, Gary, Ind., one for the McKeesport, Pa., plant and a trolley for another plant; matter still in abeyance.

Seven cranes for the plant at Sparrows Point, Md., of the Bethlehem Steel Corp., ranging from five to 25 tons in capacity, the list being reduced from 11; action expected shortly.

Five 5-ton cranes, one 3-ton crane, and five 3-ton 2-motor cab-controlled hoists for the Westinghouse Airbrake Co., Wilmerding, Pa.; matter to be closed up this week.

Two 40-ton and two 10-ton cranes for the machine shop at Homestead, Pa., of the Carnegie Steel Co., Pittsburgh, which also is tabulating bids on open-hearth charging cranes, soaking pit cranes, and a large amount of similarly heavy equipment for Homestead and other points; matters expected to be closed up this week.

Two bucket handling high speed electric cranes, each with 49-foot span, and 41-foot lift, for the American Cyanamid Co., 511 Fifth avenue, New York; expected to be closed shortly.

Two large gantry cranes for the Pennsylvania railroad, Conway, Pa.; recommendations forwarded to Philadelphia two weeks ago, not heard from.

Crane for United States Radiator Co. plant to be constructed at Corry, Pa.; pending.

4-ton electric crane for Electric Machinery Mfg. Co., 1331 North East Tyler street, Minneapolis, Minn.; pending.

100-ton electric crane for the Schenectady, N. Y., plant of the General Electric Co.; inquiry withdrawn.

15-ton electric crane, 32-foot span, for shop installation for the New York Rapid Transit Co., 85 Clinton street, Brooklyn, N. Y., bids asked; this was reported in last week's issue as having been sent out by the Brooklyn Rapid Transit Co., of the same address; as noted previously, the New York Rapid Transit Co. is also in the market for a 25-ton electric crane for a substation.

10-ton or 15-ton crane for the Marion Foundry & Machine Co., Marion, O.; matter in abeyance.

30-ton gantry crane, 100-foot span, with 15-foot cantilever on each end, for the Lehigh Valley railroad, bids asked; for installation at Packerton, Pa.

5-ton handpower overhead crane for the Erie railroad, 30 Church street, New York, bids asked.

Recent Industrial Business Changes

THE Chicago Pneumatic Tool Co., Chicago and New York, in connection with its subsidiary companies, Canadian Pneumatic Tool Co., Ltd., Montreal, and the Consolidated Pneumatic Tool Co., Ltd., London, England, announces the transfer of Howard Bird, for several years general manager of the Canadian company, with headquarters in Montreal, to the position of managing director of the Consolidated Pneumatic Tool Co., and director of European sales of the Chicago Pneumatic Tool Co., with headquarters in London. He succeeds the late H. D. Megary. D. M. Wesbrook has been transferred from district sales manager, Minneapolis branch to Montreal, as general manager of the Canadian Pneumatic Tool Co., to succeed Mr. Bird.

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Independent Metal Strap Co., New York, has been dissolved.

* * *

Gurney Ball Bearing Co., Jamestown, N. Y., has been dissolved.

* * *

National Stamping Co., St. Joseph, Mich., capitalized at $25,000, has filed dissolution papers.

* * *

United Alloy Steel Corp., Canton, O., has moved its Cleveland office to 2004 Union Trust building, 925 Euclid avenue. The office is in charge of R. B. Kelley and N. L. Schneider.

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Edwards-Lawton Mfg. Co., Detroit, has changed its name to the Detroit National Stamping Co.

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Davison-Namach Foundry Co., Deer Park, N. Y., has filed papers of dissolution.

* * *

Mignon Electric Mfg. Corp., Rochester, N. Y., has changed its name to Haig & Haig Mfg. Co.

* * *

Petroleum Heat & Power Co. of Michigan, Detroit, has changed its name to the Automatic Oil Burner Corp.

* * *

Waterseal Concrete Roofing Tile Machinery Co., Perryville, Ind., has opened an office on the seventh floor of the Southwest National bank building, Oklahoma City, Okla. in charge of Paul T. Phillips.

* * *

The Gisholt Machine Co., Madison, Wis., engineer and manufacturer, has purchased the business of the Millholland Machine Co., Indianapolis, Ind. It procured the stock of finished machines, the parts in process, good will, trade marks, patents, patterns, drawings, etc., and will continue the manufacture at Madison of the line of products formerly built by the Millholland company.

* * *

Uhlir Welding Co., Beloit, Wis., has disposed of its old plant at 109 Lawrence street, and has purchased a new shop at 622 Cross street, having twice the capacity of its old location.

* * *

Benjamin Lance, Elgin, Ill., has taken over the interests of R. F. Birch and J. H. Birch Jr., in the Geneva Tool & Machine Co., that city. Mr. Lance plans enlargements and establishment of new departments.

* * *

The American Sintering Co., American Ore Reclamation Co., and Buffalo Sintering Corp., removed their offices on June 15 from 86 East Randolph street, to 1108 Straus building, 310 South Michigan boulevard, Chicago.

* * *

P. H. & F. M. Roots Co., Connersville, Ind, manufacturer of blowers, fans, water and vacuum pumps, has made D. R. Schively manager of the office recently established at 1576 Union Trust building, Cleveland.

New Construction and Enterprise

ATTALLA, ALA.—The A. C. Foundry Co. recently incorporated, has started construction of plant for manufacture of castings and various machine shop products. J. W. Alford and J. W. Carroll are associated with the project.

GADSDEN, ALA.—Shook & Fletcher are reported to have acquired ore lands at Tate's Gap, Blount county, where they will erect a plant, electrically equip their mines and purchase new machinery.

EUREKA, CAL.—The Humboldt Lumber & Building Co., 233 G street, is planning construction of a saw and planing mill and will be in the market for dry kilns, etc. D. H. McFarlan is manager.

LOS ANGELES—Pacific Faucet Mfg. Co., East Sixtieth street has completed plans through its engineers, Austin Co. of California, for foundry.

LOS ANGELES—R. R. Meads, 418 East Eighth street, is having plans prepared for an 8-story 80x175-foot garage on Hope street. Norenberg & Johnson, Railway building, are architects.

OAKLAND, CAL.—The Illinois Wire & Cable Co., Sycamore, Ill., has awarded contracts for constructing first unit of six buildings on Eightieth avenue. George E. Dutton is president. *Noted March 20.*

Where additional information is presented, reference is made to date of issue in which previous item appeared.

OAKLAND, CAL.—The Union Construction Co., Kew Route Fill, plans reconstructing its plant, wharves, etc., damaged by fire April 24. *Noted May 8.*

DENVER—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., plans constructing warehouse, service and repair shops here.

GREENWICH, CONN.—The Greenwich Stove & Gas Co. has been incorporated for $50,000 by Cornelius R. Cole, Hackensack, N. J., and others of Greenwich.

HARTFORD, CONN.—The city school commission is planning purchase of about $50,000 worth of equipment for manual training schools.

NORWALK, CONN.—A. Seymour, 142 Main street, is in the market for a grinder, portable drill with bench stand and buffer.

SOUTHINGTON, CONN.—The Peck, Stowe & Wilcox Co., manufacturer of hardware, has broken ground for a new plant to house its grinding department.

WASHINGTON, D. C.—Southern railway, Southern building, is in the market for a 2500-pound steam hammer, single frame, and a 24-inch heavy duty lathe. C. R. Craig is purchasing agent.

JACKSONVILLE, FLA.—Southern Railroad warehouse building, 522 West Bay street, occupied by the United States Machinery Corp., Service Warehouse Co. and others, was damaged badly by fire recently. Henry W. Miller, Washington, D. C., is interested.

JACKSONVILLE, FLA.—Duvall Motor Co. has been incorporated for $300,000 to manufacture and sell automobiles and to own and operate garages and repair shops, with J. C. Crawford, as president and A. E. Parkes, secretary and treasurer.

JACKSONVILLE, FLA.—The Florida Machine & Foundry Co. has been incorporated for $500,000 to manufacture castings, machine shop products, etc., by Franklin G. Russell, 950 Riverside avenue, president and O. M. Smith, secretary.

SARASOTA, FLA.—Sarasota Machine Co. will enlarge its plant recently acquired from

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.49c to 3.515c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.21c
Detroit	3.25c
Los Angeles	3.75c
New York	3.34c
Philadelphia	3.10c to 3.25c
Pittsburgh	3.00c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.25c
St. Paul	3.35c

IRON BARS

Boston	3.49c to 3.515c
Buffalo	3.35c
Chicago	3.10c
Cincinnati	3.40c
Detroit	3.25c
New York	3.34c
Philadelphia	3.10c to 3.25c
St. Louis	3.25c

REINFORCING BARS

Boston	2.75c to 2.90c
Chicago	2.35c to 2.45c
Cincinnati	3.40c
Cleveland	2.66c to 3.36c
Detroit	3.25c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	3.00c
Philadelphia	2.90c to 3.00c
Pittsburgh	2.40c
San Francisco, C. L.	3.65c
San Francisco, L. C. L.	4.00c
Seattle	3.50c

SHAPES, STRUCTURAL

Boston	3.59c to 3.615c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.31c
Detroit	3.35c
Los Angeles	3.85c
New York	3.44c
Philadelphia	3.10c to 3.25c
Pittsburgh	3.10c
San Francisco	3.60c
Seattle (large shapes)	3.60c
St. Louis	3.35c
St. Paul	3.45c

PLATES

Boston	3.59c to 3.615c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.31c
Detroit	3.35c
Detroit, 3/16-inch	3.45c
Los Angeles	4.00c
New York	3.44c
Philadelphia	3.10c to 3.25c
Philadelphia, 3/16-inch	3.32c to 3.47c
Pittsburgh	3.10c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.35c
St. Paul	3.45c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.34c to 4.515c
Buffalo	4.05c
Chicago	3.90c
Cincinnati	4.00c
Cleveland	3.65c to 3.76c
Detroit	4.05c
Los Angeles	5.00c
New York	4.14c
Philadelphia	3.90c
San Francisco	4.50c
Seattle	4.75c
St. Louis	4.00c
St. Paul	4.15c

NO. 28 BLACK SHEETS

Boston	4.85c to 5.00c
Buffalo	4.75c
Chicago	4.70c
Cincinnati	4.65c
Cleveland	4.55c
Detroit	4.75c
Los Angeles	6.20c
New York	4.75c
Philadelphia	5.00c
San Francisco	5.50c
Seattle	5.75c
St. Louis	5.00c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	5.85c to 6.00c
Buffalo	5.85c
Chicago	5.60c
Cincinnati	5.85c
Cleveland	5.65c
Detroit	5.85c
Los Angeles	7.00c
New York	5.75c
Philadelphia	6.00c
San Francisco	6.35c
Seattle	6.75c
St. Louis	6.00c
St. Paul	5.75c to 6.00c

BANDS

Boston	4.315c
Buffalo	4.20c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.96c
Detroit	3.90c
Los Angeles	4.65c
New York	4.09c
Philadelphia	3.85c to 4.15c
Pittsburgh	3.70c
San Francisco	4.25c
Seattle	4.50c
St. Paul	4.00c

HOOPS

Boston	5.19c to 5.80c
Buffalo	4.65c
Chicago	4.25c
Cleveland	3.96c
Detroit	4.40c
New York	4.59c
Philadelphia, ¾-inch and wider, 20 gage and heavier	4.10c to 4.27c
Philadelphia—narrower than ¾-inch	4.60c to 4.77c
Pittsburgh	3.70c
Seattle	5.50c
St. Paul	4.80c

COLD FINISHED STEEL

Boston (rounds)	4.35c
Boston (shapes)	4.75c
Buffalo (rounds)	4.25c
Buffalo (shapes)	4.95c
Chicago (shapes)	4.40c
Chicago (rounds)	3.90c
Cincinnati (rounds)	4.15c
Cincinnati (shapes)	4.65c
Cleveland (rounds)	4.10c
Cleveland (shapes)	4.60c
Detroit (rounds)	4.20c
Detroit (shapes)	4.70c
Los Angeles (rounds)	5.75c
New York (rounds)	4.40c
New York (shapes)	4.90c
Philadelphia (rounds)	4.15c to 4.35c
Philadelphia (shapes)	4.65c to 4.85c
Pittsburgh (rounds)	3.90c
Pittsburgh (sq. hex. and flats)	4.40c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.00c
St. Paul (rounds)	4.15c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

(Subject to Shading)

	Black	Galvanized
¼-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
¼-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

J. D. Hazens machine shops at Hog Creek, and will build marine pumps.

TAMPA, FLA.—S. M. Regar, 212 Franklin street, plans purchase of planers, 20 to 24 by 8 inches, and a pipe machine, 6-inch capacity or larger.

SAVANNAH, GA.—The Savannah Blow Pipe Co., Lathrop avenue, is constructing addition to plant. Modern machinery will be installed.

BELLEVILLE, ILL.—Belleville Stove & Range Co. was damaged by fire recently with most of the loss being confined to the polishing department.

CHICAGO—Interstate Iron & Steel Co., 104 South Michigan boulevard, is in the market for an air hammer.

CHICAGO—Finished Die Castings Co., 2239 Herndon street, has been incorporated with 100 shares no par value stock, to manufacture and deal in metal castings, with Maurice P. Geraghty, Robert J. Monahan and Samuel J. Laumbard, as incorporators.

CHICAGO—The Chicago Nipple Co., 1966 Southport avenue, has purchased a 1-story mill building, 124x150 feet, adjacent to its present plant, and it will enlarge this structure and eventually may build on nearby land also acquired.

CHICAGO—Silver Marshall, Inc., 105 South Wabash avenue, has been incorporated for $30,000, to manufacture and deal in radios and electrical equipment, by McMurdo Sliver, John J. Stream, and John R. Marshall.

CHICAGO—Boyee Transmission Corp., 4427 West Kinzie street, has been incorporated with $1,250,000 capital, to manufacture and sell hydraulic transmission drive units, etc., by Ramsom W. Y. Boyee, Charles A. Dawell, and Edward W. Walter.

CHICAGO—Western Shade Cloth Co., 2100 South Jefferson street, has retained J. B. Fischer, 140 South Dearborn street, as architect and Krehbiel Co., 730 West Monroe street, as engineer, for 4-story, 80x300-foot brick and stone plant. N. A. Melvin is secretary. *Noted April 24.*

HIGHLAND PARK, ILL.—Francis D. Woolley Co., 512 Laurel avenue, has been incorporated for $20,000 to deal in and repair automobiles, manufacture and sell automobile accessories and parts, by Albert S. Louer, B. Leonard Bird and Francis L. Woolley.

PEORIA, ILL.—Haines, Mayer Co., 121 Main street, has been incorporated for $10,000 to manufacture and deal in heating furnaces, accessories and equipment, by Charles Haines, Mary Haines and Catherine E. Mayer.

RICHMOND, IND.—The F. & N. Lawn Mower Co., is having plans prepared by J. Mueller & Co., Palladium building, architect, for 4-story, 75 x 100-foot plant. *Noted May 22.*

SIOUX CITY, IOWA—The United Gas Improvement Corp. has awarded contracts for constructing a boiler house.

MARSHALLTOWN, IA.—Fisher Governor Co., South First and East Linn streets, has awarded general contract to Toppager Construction Co., Albert Lea, Minn., for 2-story, 60x125-foot plant addition and alterations. Jasper Fisher is manager. The company operates machine shops and foundries.

BRADDOCK, PA.—The board of education is to buy two lathes, a shaper, forge, annealing furnace and other qeuipment.

CONNELLSVILLE, PA.—The Western Maryland railway plans rebuilding its locomotive repair shops and engine house at Bower, near here, recently damaged by fire.

CONSHOHOCKEN, PA.—John Wood Mfg.

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Co. wants a gap press for punching 6x6-inch holes in 18 gage sheets.

CORRY, PA.—United States Radiator Co. has taken out permits for constructing warehouse extension, 25x100 feet, 1-story, of concrete and steel construction; a machine shop, 165x175 feet, steel and concrete and a 35x50-foot office building. A crane and two crane runways in the storage yard will be provided.

DANVILLE, PA.—E. W. Peters, 10 Lower Mulberry street, wants to buy a hoist and trolley, worm gear, about 10-ton capacity and a 1-cubic yard capacity clamshell bucket.

JOHNSONBURG, PA.—Schreiner Stove Co. has been chartered with $50,000 capital, by Roy B. Constable, to manufacture and deal in stoves, accessories and equipment.

MEADVILLE, PA.—The Hookless Fastener Co. has awarded contracts for constructing 5-story, 70x70-foot plant.

PHILADELPHIA—Hilton Cutlery Co., 1704 Sansom street, has been incorporated for $200,000 to manufacture cutlery, by Will J. Hilton.

PHILADELPHIA—A $6000 machine shop addition will be erected by J. E. Brinton, 5806-08 Filbert street.

PHILADELPHIA—Work will be started shortly on the erection of a plant for the Berroden Auto Supply Co., 713 North Broad street.

PHILADELPHIA—Bids were closed June 17 by the Ballinger Co., architect, for erecting a plant for Hardwick & Magee Co., at Marshall and Oakdale streets.

PHILADELPHIA—General contract for the erection of a plant for the Moore Push Pin Co., has been awarded to Harry Gill Jr., 2515 Germantown street. *Noted May* 29.

PHILADELPHIA—S. Stern, 1006 Vine street, has awarded construction contracts for 2-story, 32x80-foot sheet metal shop at 1015 Winter street.

PHILADELPHIA—A plant addition will be erected by the O'Brien Machinery Co., 113 North Third street. The proposed structure will be 1-story high, 61 x 155 feet.

PHILADELPHIA—Contract for the erection of a warehouse at the corner of Watts and Mt. Vernon streets, has been awarded by J. S. Ivens Son, to A. Raymond Raff, 1635 Thompson street.

PHILADELPHIA—William Steele & Sons Co., 219 North Broad street, have been awarded a contract for the erection of a manufacturing building for the Standard Packing Box Co., at the corner of C and Venango streets.

PHILADELPHIA—Electric Storage Battery, H. Lloyd, 671 North Broad street, president, has retained W. Steele & Sons, 219 North Broad street, to draw plans for 1-story, 100 x 203-foot plant. *Noted June* 5.

PHILADELPHIA—The Heintz Mfg. Co., Front and Olney streets, has awarded construction contracts for 1-story, 50x70-foot plant addition. The company manufactures pressed steel automobile bodies.

PITTSBURGH—The Koppers Co., Union Trust building, is in the market for locomotive cranes, shovels and buckets.

PITTSBURGH — McIntosh-Hemphill Co., Twelfth street, is in the market for grinding machines and electrical tools for a foundry.

PITTSBURGH—The McKinney Mfg. Co., Pennsylvania avenue and Metropolitan street, Northside, has awarded the Henry Shenk Co., a contract for a brick and steel building.

PITTSBURGH—The Standard Sanitary Mfg. Co. which recently purchased the Hall Pump Co. property on Galveston avenue, Northside, plans the early erection of a 4-story fireproof building, 90x250 feet.

PITTSBURGH—The William Gauge Co. has purchased property 76x204 feet at Pennsylvania avenue and Metropolitan street, Northside, for $8500 from Max Waterman, through the J. F. McClurg Co. The new owner will erect a machine shop.

SCRANTON, PA.—Nanticoke Sash Weight Co. has been incorporated with $5000 capital, by J. W. Kirby.

ST. DAVIDS, PA.—The Wayne Iron Works, Commercial Trust building, Philadelphia, plans constructing 1-story, 49x74-foot shop here. P. M. Sax, Penfield building, Philadelphia, is engineer.

UPPER DARBY, PA.—The Kinetic Engineering Co., Baltimore and Sixtieth streets, Philadelphia, has awarded construction contracts for 2-story, 60x140-foot plant on Union avenue here, for the manufacture of blowers.

SPARTANSBURG, S. C.—Piedmont Iron Works, Inc., has been incorporated for $10,000 to fabricate and deal in iron and steel reinforcements, structural steel, ornamental ironworks, etc., by H. R. Phillips, formerly of the American Bridge Co. and the Virginia Bridge & Iron Works, and H. C. Gary. Both had been with the Carolina Steel & Iron Co.

FLORENCE, S. C.—Florence Fuel & Iron Co. has been incorporated for $15,000 with Susie L. Grimsley as president and C. D. Grimsley as secretary and treasurer.

NASHVILLE, TENN.—Enterprise Furnace Co. has been incorporated for $50,000 by R. E. McCarthy and D. W. Burns.

DALLAS, TEX.—National Welding & Grinding Co., has been incorporated for $25,000 by A. F. Day, 422 East Eighth street, A. P. Allen and H. O. Feltner.

DALLAS, TEX.—W. A. Browning Machinery Co., 3125 Elm street, has awarded construction contracts for 50x100x300-foot machine shop and warehouse. Flint & Broad are architects. *Noted May* 29.

EL PASO, TEX.—The El Paso Electric railway plans constructing an addition to its power plant costing about $1,000,000, including installation of a new turbine and other equipment. Present plant capacity will be doubled.

SAN ANTONIO, TEX.—The Comal Power Co. has been incorporated for $1000 to acquire a hydroelectric site on the Guadalupe river near New Braunfels. The company is a subsidiary of the San Antonio Public Service Co. W. B. Tuttle, president of that company, also heads the Comal company.

BURLINGTON, VT.—J. Jackson, mayor, will purchase machine and woodworking tools for manual training department of proposed school.

GRANITEVILLE, VT.—Boutwell, Milne & Varnum Co., Barre, have awarded construction contracts for 2-story, 60x160-foot machine shop here.

RICHMOND, VA.—Hackley-Morrison Co., Inc., 1708 Lewis street, is in the market for a 16 or 18-inch lathe.

SEATTLE—Pacific Coast Steel Co. has awarded Wallace Equipment Co. contract for erecting plant addition.

PARKERSBURG, W. VA.—Parkersburg Machine Co. has begun constructing plant.

WHEELING, W. VA.—Steel Mine Car Co., has been incorporated for $100,000 to manufacture steel mine cars, etc., by Ira A. Stevens, Fairmont, W. Va., Robert M. Niven and Henry M. Russell.

BELOIT, WIS.—Uhlir Welding Co. has taken over a shop at 622 Cross street, for use of its machine shops, automobile repair departments, etc.

CLINTONVILLE, WIS.—Patterson Mfg. Co. has been incorporated for $10,000 to manufacture mechanical appliances, by F. R. Hasse, J. J. Hanna, and A. L. Patterson.

KENOSHA, WIS.—A $35,000 city garage and machine shop will be built on a site of 40x198 feet, at the Northwestern tracks and Congress street.

KENOSHA, WIS.—Hugo E. Bothe, architect, and Julius Krueger will open a plant for making hardware specialties. The main product will be a combination hinge and lock designed for sash and windows.

KENOSHA, WIS.—Central senior high school, 3-story, 250x250 feet, of reinforced concrete and stone, is being designed by John C. Chubb, 109 North Dearborn street, Chicago. Lewis P. Powell is president of the board of education. General contractor's bids closed June 23. Mechanical and vocational departments are to be provided. *Noted June* 12.

KIEL, WIS.—Rudolph Greve Co. plans purchase of sheet metal working machinery.

MADISON, WIS.—The Wisconsin Pump & Mfg. Co., capital stock $25,000, has been incorporated here by W. S. Hanks, R. A. Andrews and W. P. J. Aberg, attorney, to open a pump and machine works.

MILWAUKEE—Display Fixture Mfg. Co., 1627 St. Paul avenue, will double its capacity for making metal, glass and other specialties. The new plant is to be located at 1714 St. Paul avenue, 2-story, 50 x 120 feet.

MILWAUKEE—Grover Co. has been incorporated for $15,000 to do machine work and mechanical repairing, with Ray Grover, 3222 Mt. Vernon avenue, and Henry H. Kurth, 560 Thirtieth street, as incorporators.

MILWAUKEE—The Carbon Engineering Co., 252 Milwaukee street, has let contracts for the erection of a plant at 1700 Eighth avenue. It will be of reinforced concrete, 1-story, 64x48 feet. William Helwig is manager.

MILWAUKEE—The Oilgear Co., 400 Thirty-eighth street, has purchased a site at 701 Park street, where it will construct a 90 x 175-foot machine shop. Worden-Allen Co. will erect the building.

MILWAUKEE—James E. Gilbert has incorported the J. E. Gilbert Grinder Co., with $15,000 capital, to manufacture grinders and similar tools, William N. John, president of John Chuck Co., 203 Grand avenue, is connected with Mr. Gilbert in the new company.

MILWAUKEE—The Standard Sanitary Mfg. Co., Pittsburgh, which has outgrown its Milwaukee plant and warehouse at 311-315 Fifth street, will build a 5-story fireproof building, 80x175 feet, on St. Paul avenue, at Seventeenth street. The work has been placed in charge of the Hunting-Davis Co., 1150 Century building, Pittsburgh. F. E. Fowle is local manager at 426 Broadway.

NEILLSVILLE, WIS.—Clark Co. plans purchase of machine tools and equipment for proposed plant for repairing roadworking equipment. O. J. Weyhmiller is highway commissioner in charge.

OCONTO, WIS.—Holt Lumber Co. is to rebuild plant recently damaged by fire. Electric motors, conveyors, hoists, machinery for machine shop, etc., will be purchased. W. A. Holt is in charge.

RHINELANDER, WIS.—The Oneida Chuck Co., capital stock $25,000, has been incorporated here by E. A. Forbes, Arthur J. LaMotte and R. J. LaSelle to manufacture chucks, tools, jigs, etc.

SHOREWOOD, WIS.—Architects Herbst & Kuenzli, 115 Grand avenue, Milwaukee, are preparing plans for the manual training unit of the new Shorewood high school, and bids will

(*Continued on Page* 1716)

WABIK METAL

for

Vitreous Enameling

BROILER PANS
Splasher Backs: Stove Door Panels: Table Tops: Signs: Refrigerators: and other Flat Work

Wabik Metal Sheets, like all other Mansfield Products, are rolled from our own "Bottom-poured Ingots." They are very low in sulphur.

Other Specialties:

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS
PICKELED and ANNEALED
ENAMELING STOCK
for Kitchen Utensils
MILK CAN STOCK

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to all of the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for unsurpassed reliability.

We invite your inquiries.

SHEET BARS and INGOTS

MANSFIELD SHEET & TIN PLATE COMPANY

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., 1106 National City Bldg., New York, N. Y.
Mansfield Sheet & Tin Plate Co., 1372 Wrigley Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., 12-237 General Motors Bldg., Detroit, Mich.
The L. D. Rockwell Co., 2002 Union Trust Bldg., Cleveland, O.
Wm. L. Hoffman, 1504 West Venango St., Philadelphia, Pa.
Mr. C. H. Beack, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron.$5.65
Mesabi bessemer, 55 per cent iron.... 5.40
Old Range nonbessemer, 51½ per cent iron 4.90
Mesabi nonbessemer, 51½ per cent iron 4.75

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent ..... 9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent ..... 12.50 to 14.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 9.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.. 11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent ..... 9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent ..... 8.00 to 9.00
Alegerian foundry and basic, 50 to 54 per cent ..... 8.00 to 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent.....
....nominal 41 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent.....
.....Ordinary, 43 cents c.i.f. tidewater
.....Washed, 46 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton $19.00 to 23.50
Washed gravel, imported duty paid eastern tidewater, per gross ton ..... 20.60 to 21.10

Rivets

Structural rivets, C. L. Pitts.. 2.50c to 2.65c
Structural rivets L. C. L. Pittsburgh ..... 2.65c to 2.75c
Rivets, 7/16-in. and smaller.....
.....70 and 10 off to 70, 10 and 10 off

Nuts and Bolts

(Up to 1¾ and 1½ inches inclusive)

Hot pressed square or hexagon blank .....$5.00 to 4.75 off list
Hot pressed square or hexagon tapped .....$5.00 to 4.75 off list
Cold punched square or hexagon blank .....$4.50 to 4.25 off list
Cold punched square or hexagon.... .....$4.50 to 4.25 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger .....80 and 10 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller ....80, 10 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS
(¾ x 6 inches, smaller and shorter)

Rolled thread .....60 and 20 off
Cut thread .....60 and 10 off
Larger and longer .....60 and 10 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60, 20 and 10 off
Cut thread .....60 and 20 off
Larger and longer .....60 and 20 off
(All sizes cold punched nuts)
Cut thread .....50,10 and 10 off
Lag screws .....65 and 20 off
Plow bolts Nos. 1, 2 and 3 heads.. .....50 and 10 off
4 to 10 heads.....50-10 + 20 off
Flat and round head stove bolts..... .....80,10 and 5 off
Other stove bolts .....80, 10 and 5 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts..... .....60 and 20 off
Bolt ends with cold punched nuts.... .....50, 10 and 10 off
Blank bolts .....60 and 20 off
Rough stud bolts with nuts (250 pieces or more of a size)..... ....45, 10 and 5 off

Washers

Wrought .....$5.50 to $6.00 off
Lock washers .....80 per cent off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	49	32½
11 and 12-inch	43	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers' carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts, C. L. 4 points larger

STEEL (Lap Welded)*
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON*
(Effective April 12, 1923)

1½-inch ..... +22
1¾-inch ..... +12
2 and 2¼-inch..... + 2
2½ to 3-inch 3
3¼ to 4½-inch..... 5

SEAMLESS COLD DRAWN*
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING*
Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES*
(Effective April 19, 1923)

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

*Published discounts are subject to considerable shading, in some cases as much as three extra 5 per cents.

Hot Rolled Alloy Steels

Prices per pound, Pittsburgh

S. A. E. Series—

2300 (3½ per cent nickel)... 5.00c
3100 (nickel chromium)..... 4.00c
6100 (chrome vanadium) 4.75c
6100 (chrome vanadium spring) 4.50c
9250 (Silico manganese spring) 4.00c to 4.25c

SIVYER S CASTINGS
DEPENDABLE

Unretouched photographs of front and rear engine brackets, for three point suspension, made in Sivyer Electric Steel.

Displacing malleable iron with true and smooth steel

IN past years many automotive engineers who wished to replace malleable castings with steel, were deterred because they thought that all steel castings lacked the finish and trueness to pattern that they had come to associate exclusively with malleable. Modern foundry practice and the electric furnace, however, can now produce castings smooth, clean and absolutely true to pattern. Those shown above were made from patterns perfectly suitable for malleable practice. The purchaser preferred steel because of its strength, elasticity and resistance to crystallization. Ordinary steel was serviceable but rough; Sivyer Steel supplied what was wanted.

Send Blue Prints

A number of automotive manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically, or at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel.

The last class includes especially castings with thin and sharply varying sections, and castings that have to be true to pattern, clean and smooth in order to fit the assembly with the minimum of finishing.

With Sivyer Electric Steel we have been able to show automotive engineers very decided advantages and economies, not only as against ordinary steel castings and hammered forgings, but also as against malleable castings and fabricated steel.

A certain manufacturer formerly fabricated rocker beams for a crawler chassis by welding two stampings and then pressing in, and welding, sections of steel tubing. The shortcomings, and unnecessary expense of this method were not realized until it was found that the stampings did not have the body required to carry certain desirable attachments. Forgings were impractical. Open hearth practice does not permit the high temperatures necessary for casting thin sections such as those of the design in question. The manufacturer's organization naturally turned to Sivyer Electric Steel. It proved to have all the qualities desired and effected an appreciated reduction in the final cost of the part.

In a number of other cases we have been able to free automotive engineers from the handicaps of hammered forgings and in effect give them much greater freedom in design.

We are especially interested in making experimental castings for manufacturers with problems like those described above. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Construction and Enterprise

(*Continued from Page* 1712)

be taken some time in July. Contracts were let late in May for the first of the group of buildings, which ultimately will cost $1,000,000. *Noted May* 22.

STOUGHTON, WIS.—Gjerston Bros. Co. is in the market for machinery and equipment for machine and repair shop.

Business in Canada

CALGARY, ALB.—George Stewart & Co., are in the market for a small gap lathe, also 50 to 75-horsepower automatic engine.

ST. JOHN, N. B.—MacLean & Holt Co., Ltd., are in the market for complete equipment for a molding shop and foundry. J. L. McAnty is purchasing agent.

BALA, ONT.—Bala Electric Light & Power Co., has let general contract for erection of power plant to cost $30,000 to Allen Dixon.

BRIDGEBURG, ONT.—Horton Steel Works, Ltd., is in the market for a rotary planer, with 48 to 50-inch head preferred. W. R. Manock is manager.

HAGERSVILLE, ONT.—W. T. Wilton is in the market for 15 horsepower motor and one 20-horsepower motor, 3-phase, 60-cycle, 550-volt.

HUNTSVILLE, ONT.—S. T. Hinton is in the market for machinery and equipment for boat building plant.

KINCARDINE, ONT.—Electric Light & Power Works Commission is asking for the following equipment: One 30 or 35-horsepower motor, 220-volt, 3-phase, 60-cycle, from 1200 to 1800 revolutions per minute, complete with base and starter; motor wi h pulley shafts extending both ends preferred; 18-inch double head ball bearing grinder.

KINGSTON, ONT.—Warren & Williams, 110 Clergy street, will purchase machinery, lathes, tools, etc., for automobile repair plant here.

KINGSTON, ONT.—W. Milners, 55 Colburne street, has plans for purchasing machinery to equip machine shop.

LAKEFIELD, ONT.—Lakefield Brass & Metal Works is having plans prepared for the erection of a plant for which bids will be called at an early date. Machinery and tools will be purchased.

LONDON, ONT.—Richards Wilcox Canadian Co., Chelsea Green, is taking bids for constructing 150x250-foot plant for manufacture of hardware specialties. W. R. Yendall is manager. Watt & Blackwell, architects, Bank of Toronto, are receiving bids for the erection of the plant to cost $40,000. No closing date has been set.

NORTH BAY, ONT.—The Temiskaming & Northern Ontario Railway commission has let the general contract to Stuart & Sinclair, Hamilton, Ont., for the erection of an engine house here to cost $75,000.

OTTAWA, ONT.—The Ottawa Electric Co., has started work on the erection of repair shop and car barns on Champagne avenue, to cost $200,000. John Sutherland has the general contract.

PETERBORO, ONT.—The Canadian General Electric Co., has let the general contract for addition to its plant here to the McLead Construction Co., Toronto, Ont. Construction work will start immediately. The new building will be 85 x 160 feet, 4-story. The plant will manufacture switch gear, etc. *Noted May* 1.

PORT ARTHUR, ONT.—The plant here owned by John Stirrett & Sons was damaged by fire June 11. The planing mill and machine shops, together with equipment will be almost a total loss. It is expected that owners will rebuild without delay.

SARNIA, ONT.—The Doherty Stove Co. plans constructing 150x480-foot plant for manufacture of furnaces, hot water heating equipment and electric stoves.

TORONTO, ONT.—The Lefroy Engineering Co., 11 Leader Lane, is in the market for a power squaring shear, 5-foot, for 16-gage sheets or lighter.

TORONTO, ONT.—Bids have been called by Hugh L. Kerr, chairman of the advisory industrial committee and W. M. Pearse, business administrator and secretary treasurer of the board of education, 155 College street, for supplying complete foundry equipment for the Riverdale branch of the technical school here.

MONTREAL, QUE.—Girouard Taxi Service, St. Dominique street, plans purchase of bench lathe and drill press for motor repairs.

MONTREAL, QUE.—L. Gau, 256 St. Antoine street, plans purchase of general equipment for a machine shop.

ST. LAURENT, QUE.—A. Bonin, 74 Principale street, proposes to erect automobile repair plant here and is interested in purchase of machinery and tools for same.

VALLEYFIELD, QUE.—The Walsh Plate & Structural Works, Ltd., of Drummondville, and Montreal, Que., is contemplating the erection of a steel plant here to cost $200,000.

WESTMOUNT, QUE.—Warren Radio Phone Mfg. Co., 3 Belevedere road, plans purchase of machinery and tools for manufacture of radio apparatus. H. E. Walker is interested.

New Trade Publications

MACHINE TOOLS—Morey & Co., Inc., New York, presents a wide assortment of rebuilt tools in a well-iffdexed catalog just issued.

BALLAST CARS—Dump and flat bottom cars, interchangeable, and other railroad cars and parts are described in a bulletin issued by the Walter A. Zelnicker Supply Co., St. Louis.

BRITISH STEEL—David Colville & Sons, Ltd., Glasgow, Scotland, is sending to the trade a booklet illuminated by handsome color pages of scenes in steel works. The company's equipment, products and some notable accomplishments are presented.

LEATHER PACKING—Proper packings for machinery to insure efficient operation is insisted on in a catalog by the Charles W. Marsh Co., Muskegon, Mich., which covers the molded leather packing produced by that company for a wide variety of uses.

BOILERS—Steel heating boilers of a special type designed to give complete combustion and smokeless gases are described in a catalog by the Birchfield Boiler Co., Tacoma, Wash. Tables of capacities and dimensions accompany descriptions of the various units.

SIRENS—As an added means of making fire-fighting forces effective the electric siren is presented by the Inter-State Machine Products Co., Rochester, N. Y., in a bulletin that describes the construction, operation and installation of this form of alarm.

ELECTRIC HOISTS—With more than 100 illustrations in its 40 pages a catalog on hoists by the Link-Belt Co., Chicago, describes this portion of the company's output. Constructive material and operation data are united to give a complete understanding of these devices.

STRUCTURAL PIPE FITTINGS—Use of pipe for outdoor substations, switchboard frames, railings and similar uses has given rise to a complete line of interchangeable pipe fittings, which is described in a circular issued by the Westinghouse Electric & Mfg. Co., East Pittsburgh.

PUMPS—Centrifugal pumps for various uses and in many capacities manufactured by the Goulds Mfg. Co., Seneca Falls, N. Y., are shown in a bulletin by that company, calling attention to special publications giving full details of each sort of apparatus for those especially interested.

PUNCHES AND SHEARS—Sandwiched between pages of descriptive matter relating to the city of Cleveland, the Cleveland Punch & Shear Works Co., Cleveland, describes its products in a catalog issued for distribution during the recent Republican national convention.

ELECTRIC METERS—Small portable electric measuring instruments for alternating and direct current, ammeters, milliammeters, voltmeters millivoltmeters, volt-ammeters and wattmeters are described in detail in two bulletins by the Roller-Smith Co., New York. Construction and use of the instruments are set forth thoroughly.

STEELS—Adapting alloy steels to their several purposes is the object of a booklet prepared by the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. Actual instances where change in the analysis of steel used for certain purposes gave prolonged life and better service are presented in the brochure, with a list of articles preferably made of a special steel.

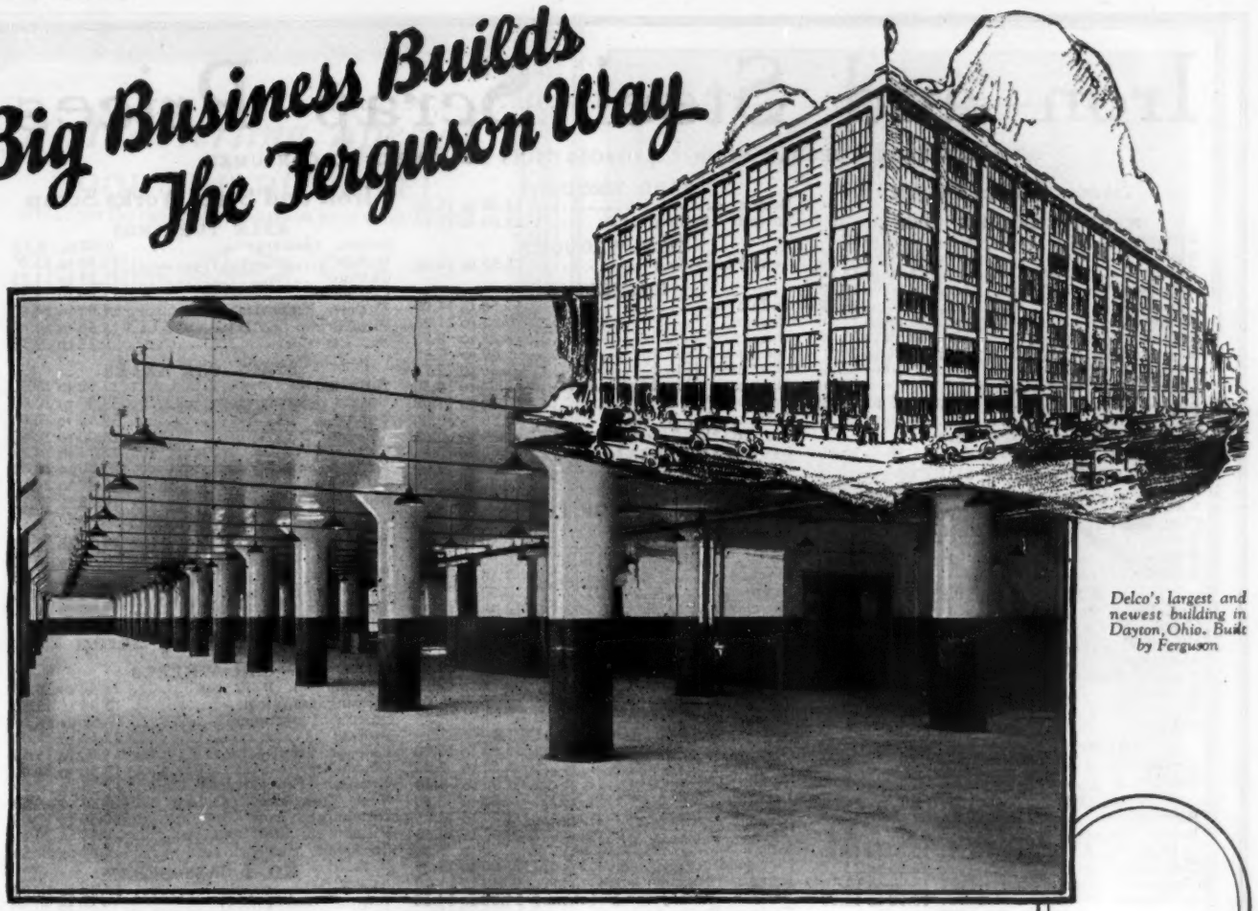
CENTRIFUGAL PUMPS—Double suction centrifugal pumps with horizontally split casings form the subject of a bulletin by the Morris Machine Works, Baldwinsville, N. Y. Construction and operating details are presented, typical performance curves show efficiency and the use of the pumps for handling various liquids is outlined.

HYDRAULIC MACHINERY—From their large line of tools and machinery using hydraulic power R. D. Wood & Co., Philadelphia, have described and illustrated in a current catalog, machinery more or less typical for the metal and rubber industries. A wide variety of tools for this purpose is illustrated and capacities and uses described.

STEEL HAND BOOK—Morris Wheeler & Co., Philadelphia, have published a volume containing weights and extras for mill and warehouse on bars, sheets, shapes, plates hoops, bands, cold rolled steel, rails, tire steel, Swedish iron, boiler tubes and gage tables, quantity differentials and plate and shape cutting extras.

AUTOMATIC SURFACE GRINDERS—A grinder designed for quantity production of smaller pieces is described in a bulletin sent out by the Blanchard Machine Co., Cambridge, Mass. The bulletin is devoted principally to illustrations of various classes of small work handled by this machine, with production data in each case and brief description and specifications of the machine.

Big Business Builds The Ferguson Way



Delco's largest and newest building in Dayton, Ohio. Built by Ferguson

Delco chose Ferguson to build their biggest building, *because*—

They required low cost, moderate speed and high quality.

They had watched Ferguson build in three years five important buildings for the National Cash Register Company.

They learned that for many years Ferguson had been designing, building and equipping factories for America's leading industries, with one organization and one profit. They desired to make one reliable company responsible for the whole job—and gave Ferguson the contract.

The H. K. Ferguson Company owns quantities of essential materials, which it erects with the best of modern construction equipment, and the ablest, experienced building men.

Ferguson builds permanent factories of concrete, brick and steel, complete in thirty working days, or handles heavy industrial construction such as its two-year job now under way in Japan.

Every Ferguson building has back of its design an experience which makes it safe and satisfactory, both as a single structure and as a plant unit. *The Ferguson organization guarantees its buildings*, big or little, in design, in construction, in cost and in delivery date.

No matter where you are, no matter what type of industrial building you require, you should get the Ferguson proposition before you start your plans. Come, telephone, telegraph—or write for Booklet "F"

Executives!

No officer or director of a corporation can truthfully say that he has properly served the interests of his company, in connection with a substantial building program, unless he has given careful consideration to the H. K. Ferguson Company's proposal for the designing, construction and equipping of his plant.

Cleveland Office: 4900 Euclid Bldg. Telephone, Randolph 6854

THE H. K. FERGUSON COMPANY

New York Office: 25 W. 43rd St. Telephone, Vanderbilt 4526

Ferguson

GUARANTEED BUILDINGS

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	11.00 to 12.00
Boston (dealers)	10.50 to 11.00
Buffalo	13.50 to 14.00
Chicago	13.50 to 14.00
Cleveland	14.00 to 14.25
Cincinnati	11.00 to 11.50
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	11.50 to 12.00
Pittsburgh	16.50
St. Louis	12.75 to 13.25
Valleys	16.00 to 16.75
No. 1 railroad steel New York (dealers)	11.50 to 12.00

COMPRESSED SHEETS

Buffalo	13.00 to 13.50
Chicago	10.00 to 10.50
Cleveland	11.75 to 12.00
Detroit (dealers)	10.50 to 11.00
Pittsburgh	15.00 to 15.50
Valley	14.25 to 14.50

BUNDLED SHEETS

Buffalo	8.50 to 9.00
Cincinnati	8.50 to 9.00
Cleveland	11.50 to 12.00
Detroit	8.50 to 9.00
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	14.00 to 14.50
St. Louis	8.50 to 9.00
Valleys	12.00 to 12.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Detroit	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	13.00 to 14.00
Boston (dealers)	12.00 to 12.50
Chicago	16.00 to 16.50
Cincinnati	15.00 to 15.50
Cleveland (over 6 ft.)	13.00 to 13.50
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	15.00 to 15.50
Buffalo	15.00 to 15.50
Chicago	15.00 to 15.50
Cincinnati (net tons)	8.50 to 9.00
Cleveland	13.25 to 13.50
Detroit (net ton) dealers	12.00 to 12.50
Eastern Pennsylvania	14.50
New York (dealers)	11.50 to 12.00
Pittsburgh	13.50 to 14.00
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	18.00 to 18.50
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	19.00 to 20.00
Pitts. billet and bloom crops	21.50 to 22.00

SHOVELING STEEL

Chicago	13.25 to 13.75
Pittsburgh	13.50 to 14.00
St. Louis	12.75 to 13.25

KNUCKLES, COUPLERS, SPRINGS

Chicago	16.50 to 17.00
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	19.50 to 20.00
St. Louis	16.25 to 16.75

FROGS, SWITCHES, GUARDS

Chicago	13.50 to 14.00
Eastern Pennsylvania	15.00 to 15.50
St. Louis	13.50 to 14.00

BOILER PLATE, CUT

St. Louis	6.50 to 7.00

ANGLE BARS—STEEL

Chicago	15.25 to 15.75
St. Louis	14.00 to 14.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	12.50 to 13.00
Buffalo	12.50 to 13.00
Cleveland, No. 1	11.50 to 12.00
Chicago, No. 1	13.25 to 13.75
Chicago, No. 2	13.50 to 14.00
Cincinnati, No. 1	10.00 to 10.50
Detroit, No. 2	12.50 to 13.00
Eastern Pennsylvania	17.50 to 18.00
New York, No. 1 (dealers)	15.00 to 15.50
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	16.50
St. Louis No. 1	10.50 to 11.00
St. Louis, No. 2	12.75 to 13.25

WROUGHT PIPE

Boston (dealers)	9.50 to 10.00
Buffalo	11.00 to 12.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	10.25 to 10.75

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	16.00 to 17.00

CITY WROUGHT

New York, long	13.50 to 14.00

BUSHELING

Buffalo	13.50 to 14.00
Chicago, No. 1	10.75 to 11.25
Chicago, No. 2	8.25 to 8.75
Cincinnati, No. 1	9.00 to 9.50
Cleveland, No. 1	12.50 to 12.75
Cleveland, No. 2	10.00 to 10.50
Detroit, No. 1	10.50 to 11.00
Detroit, No. 1 (new)	9.50 to 10.00
Detroit, No. 2 (old)	8.50 to 9.00
Eastern Pennsylvania	14.00 to 15.00
Pittsburgh, No. 1.	13.50 to 14.00
St. Louis, No. 1.	12.00 to 12.50

MACHINE SHOP TURNINGS

Birmingham	5.00 to 6.00
Boston (dealers)	7.50 to 8.00
Buffalo	10.50 to 11.00
Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Cleveland	12.00 to 12.25
Detroit (dealers)	9.25 to 9.75
Eastern Pennsylvania	12.00 to 12.50
New York (dealers)	8.50 to 9.00
Pittsburgh	13.00 to 13.50
St. Louis	6.50 to 7.00
Valleys	11.75 to 12.00

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	6.50 to 7.00
Boston (chemical)	9.00 to 9.50
Boston (dealers)	8.00 to 8.50
Buffalo	11.50 to 12.00
Chicago	10.00 to 10.50
Cincinnati	8.50 to 9.00
Cleveland	13.00 to 13.25
Detroit (dealers)	10.50 to 11.00
Eastern Pennsylvania (chem.)	14.00 to 14.50
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	8.50 to 9.00
Pittsburgh	14.00 to 14.50
St. Louis	8.75 to 9.25
Valleys	13.75 to 14.25

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	6.50 to 7.00
Cleveland	13.00 to 13.25
Detroit (dealers)	10.25 to 10.75
Eastern Pennsylvania	11.00 to 11.50
New York (dealers)	8.00 to 8.50

IRON AXLES

Birmingham	19.50 to 20.00
Boston (consumers)	31.00 to 32.00
Buffalo	25.00
Chicago	26.00 to 26.50
Cincinnati	18.00 to 18.50
St. Louis	26.00 to 26.50
New York (dealers)	23.00 to 24.00
Eastern Pennsylvania	20.00 to 22.00

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	17.50 to 18.00
Cincinnati	10.50 to 11.00
St. Louis	10.50 to 11.00

PIPES AND FLUES

Chicago	9.50 to 10.00
Cincinnati	8.00 to 8.50
Cleveland	10.00 to 10.25
St. Louis	7.00 to 7.50

RAILROAD GRATE BARS

Buffalo	15.00 to 15.50
Chicago	14.50 to 15.00
Cleveland	13.75 to 14.00
Eastern Pennsylvania	14.50
New York (dealers)	12.50 to 13.00
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	9.00 to 9.50
Cleveland (under 10 in.)	11.50 to 12.00
Cleveland (over 10 in.)	9.50 to 10.00
Detroit (dealers)	9.00 to 9.50

FORGE SCRAP

Boston (dealers)	8.00 to 8.50
Chicago	16.00 to 16.50
Eastern Pennsylvania	13.00 to 13.50

ARCH BARS AND TRANSOMS

Chicago	18.50 to 19.00
St. Louis	17.50 to 18.00

ANGLE BARS—IRON

Chicago	17.50 to 18.00
St. Louis	17.00 to 17.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	14.50 to 15.00
Chicago	11.25 to 11.75
Cleveland	13.00 to 13.50
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh,	15.50 to 16.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston (consumers)	19.00 to 20.00
Buffalo	19.00 to 20.00
Chicago	18.00 to 18.50
Cleveland	17.75 to 18.25
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	19.50 to 20.00
St. Louis	16.75 to 17.25

SHAFTING

Boston (consumers)	19.00 to 20.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	22.00 to 24.00
New York (dealers)	17.00 to 17.50
St. Louis	19.00 to 19.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	15.50 to 16.00
Birmingham, iron	15.00 to 15.50
Boston (consumers)	19.00 to 19.50
Buffalo	17.50 to 18.00
Chicago, iron	15.00 to 15.50
Cincinnati	10.50 to 11.00
Eeastern Pennsylvania	17.50 to 18.00
New York iron (dealers)	14.50 to 15.00
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	19.50 to 20.00
St. Louis, iron	14.00 to 14.50

NO. 1 CAST SCRAP

Birmingham, cupola	17.00 to 18.00
Boston (consumers)	19.50 to 20.00
Buffalo	16.50 to 17.50
Chicago, No. 1 machinery	17.50 to 18.00
Cincinnati No. 1 machinery cupola (net tons)	15.50 to 16.00
Cleveland, cupola	19.00 to 19.50
Detroit (net tons) (dealers).	15.50 to 16.00
Eastern Pennsylvania, cupola.	17.50 to 18.50
New York, cupola (dealers).	14.00 to 14.50
Pittsburgh, cupola	17.50 to 18.00
San Francisco	20.00
St. Louis, railroad	18.00 to 18.50
St. Louis, agricultural	18.00 to 18.50
Valleys	19.50 to 20.00

HEAVY CAST

Boston (consumers)	15.50 to 16.00
Buffalo (breakable)	15.00 to 15.50
Cleveland	12.25 to 12.50
Detroit (automobile) (net ton)	16.50 to 17.00
Eastern Pennsylvania	16.00
New Yorkk (dealers)	12.50 to 13.00
Pittsburgh	15.50 to 16.00

MALLEABLE

Boston (railroad)	16.50 to 17.00
Buffalo	19.00 to 19.50
Chicago, railroad	16.00 to 16.50
Chicago, agricultural	15.50 to 16.00
Cincinnati, agricultural	10.50 to 11.00
Cincinnati, railroad	15.00 to 15.50
Cleveland, agricultural	15.75 to 16.00
Cleveland, railroad	16.75 to 17.00
Detroit (dealers)	16.50 to 17.50
Eastern Pennsylvania, railroad	15.50 to 16.50
Pittsburgh, railroad	15.50 to 16.00
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	13.25 to 13.75

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, tram car	14.50 to 15.00
Boston (dealers)	14.00 to 14.50
Chicago	14.25 to 14.75
Cleveland	15.50 to 16.00
Detroit	12.00 to 12.50
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	14.00 to 14.50
Pittsburgh district	17.00 to 17.50
St. Louis	14.75 to 15.25

LOCOMOTIVE TIRES

Chicago	17.00 to 17.50
St. Louis	14.00 to 14.50

LOW PHOSPHORUS PUNCHINGS

Chicago	14.50 to 15.00
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HUNDREDS of manufacturers have used *Standard* Cold Drawn Steel for ten, twenty, twenty-five years or more. These firms have most naturally come to expect a consistent quality that in their estimation ranks highest throughout the country.

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Standard Gauge Steels

Starting in 1916

The "*regretted* absence of the junk pile" is depicted below—reproduced from metallurgical and Chemical Engineering of July 1916.

94 METALLURGICAL AND CHEMICAL ENGINEERING JULY 15, 1916
marks the spot where
the junk pile of cast iron and steel carburizing boxes used to be every week. The junk man notes with regret the obvious absence since they have adopted "NICHROME" carburizing boxes. Nichrome boxes are not made to foster the junk business but to make more profitable the hardening department.
HARDENING DEPT
JUNK
Nichrome
DRIVER-HARRIS WIRE CO.
CHICAGO HARRISON, N. J.

WE WILL be glad to show you, by *performance records*, how more than 1200 users of Nichrome are now *enjoying* the absence of the junk pile—and the advantages of more uniform results.

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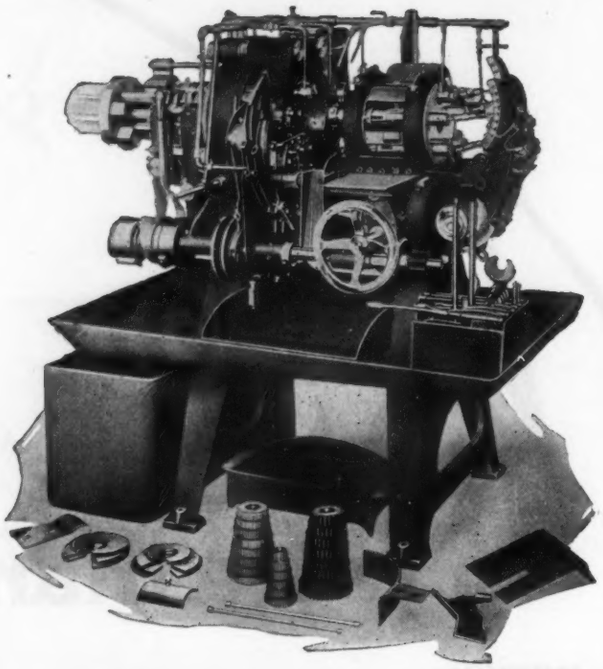

Vanadium Steel in the Davenport 5 Spindle Automatic

VITAL parts of the well-known Davenport 5 Spindle Automatic Screw Machine are made of Chrome-Vanadium Steel.

Straight carbon steel was formerly used in these parts, but the Davenport Machine Tool Company, Rochester, N. Y., found that carbon steel would not stand the stresses and operating speeds for which the machine was designed.

Chrome-Vanadium Steel solved the problem, and is contributing largely to the efficiency of the machine and its high production over long periods. Replacements have been practically negligible since Chrome-Vanadium Steel was adopted.

Check up the steel used in your product or in your manufacturing operations. Somewhere there may be a point where Vanadium Steel instead of Carbon Steel will improve the product or reduce production costs. Our Metallurgists will gladly help you make the check up and select the better steel for the purpose.

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(*Continued in the next issue.*)

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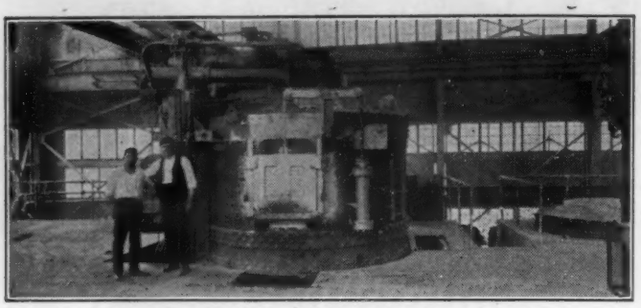

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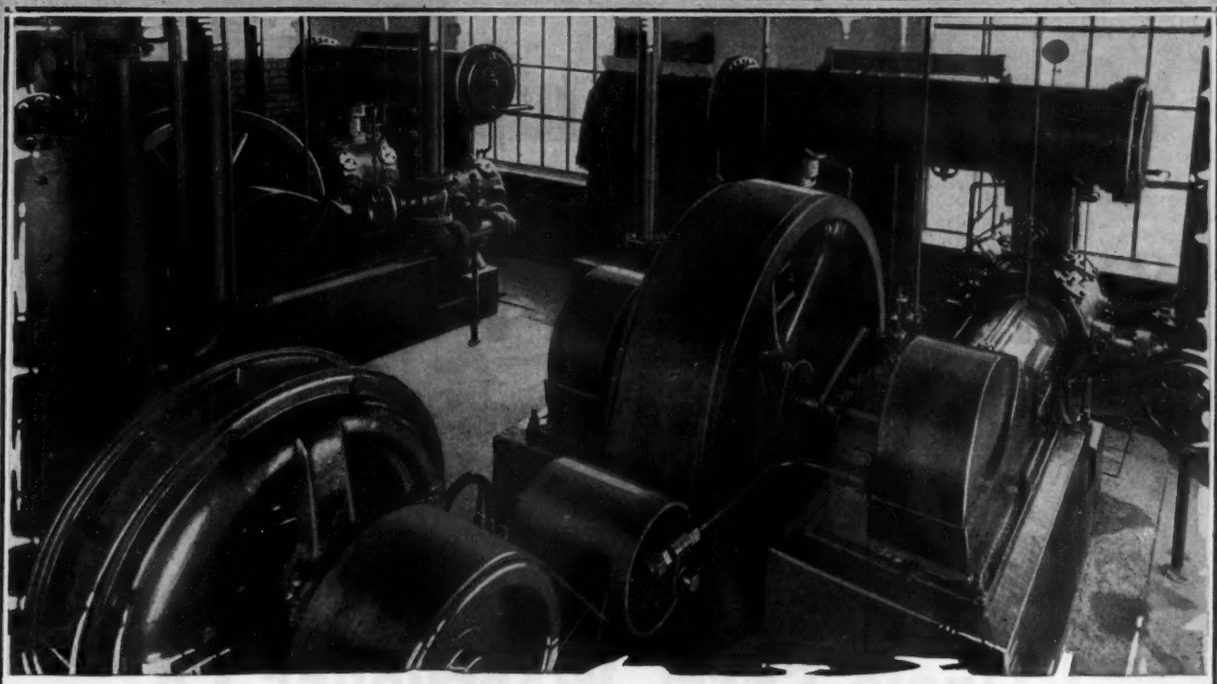

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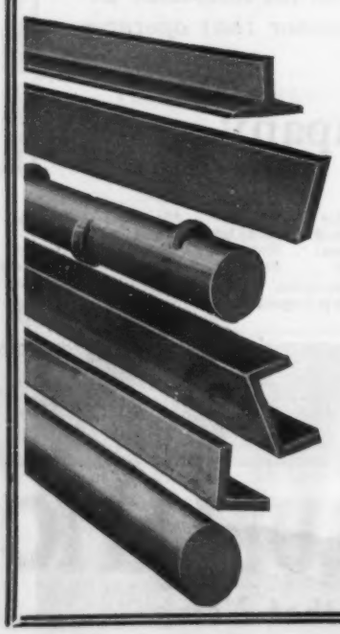

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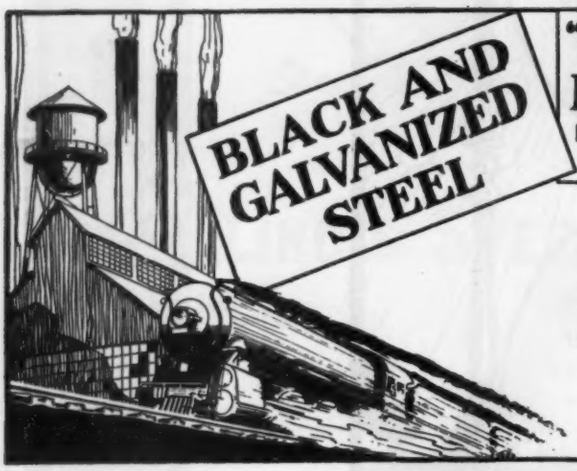

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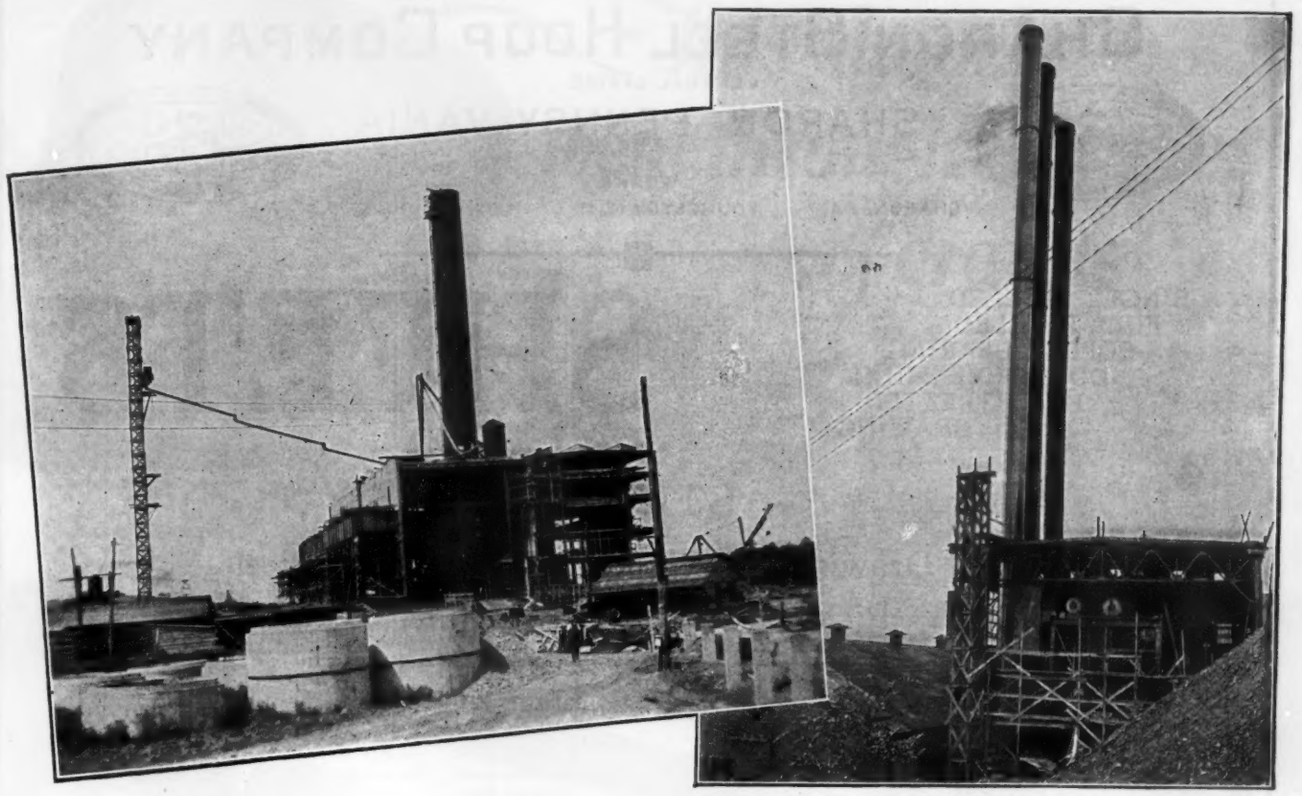

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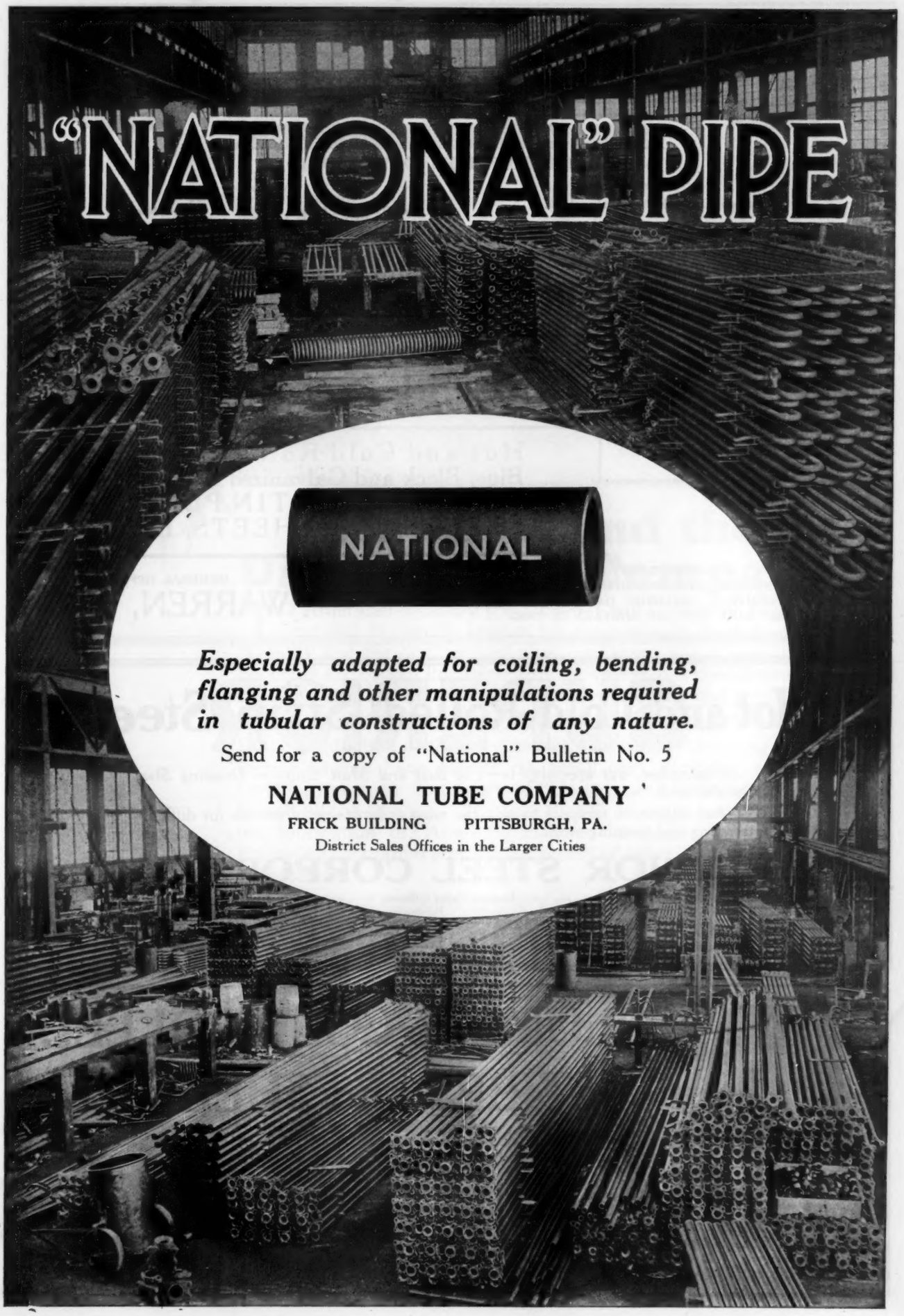
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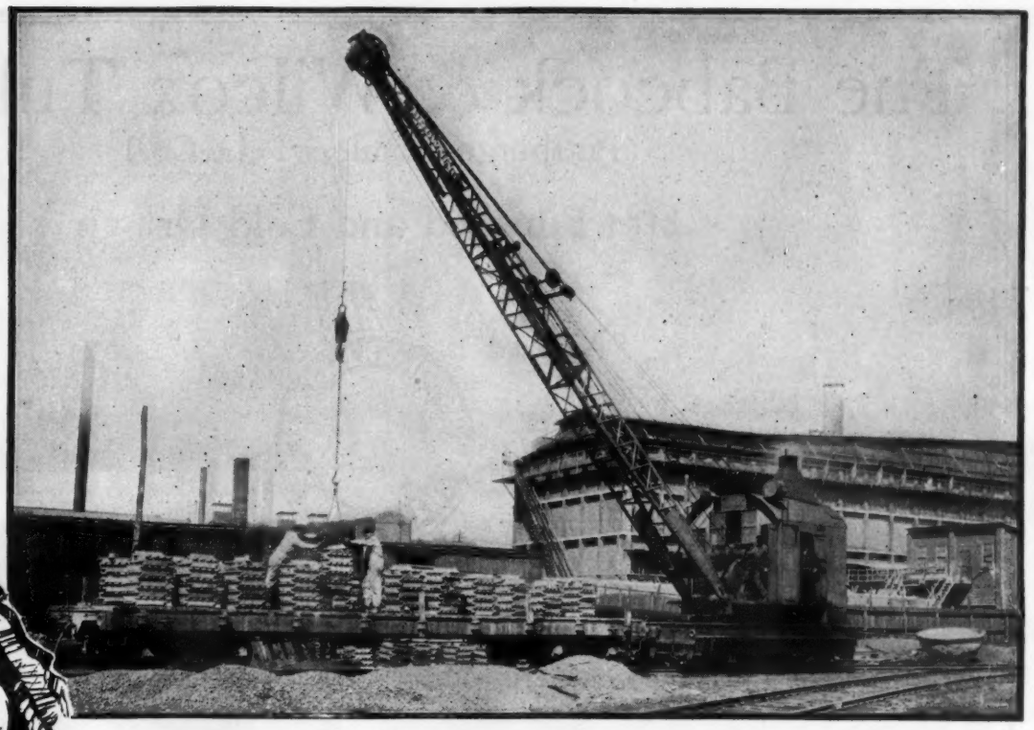

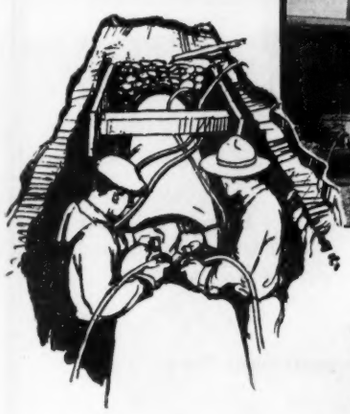

Browning and the United Lead Company

TO American industry the United Lead Company has been long and favorably known for their reliable lead products. "Quality and Service" in lead pipe, lead traps, sheet lead and in tin, brass and copper lined pipe, fittings, valves, has been the slogan to which they have constantly adhered, perfecting and developing this specialized equipment for industry's many requirements.

In the production of these industrial necessities Browning Locomotive Cranes have played no small part, reducing material handling costs so that users of "United Lead" Products might benefit by the savings. The part that Brownings have played in the fabrication of "Anything in Lead" is another example of Browning economies effected for scores of other leaders in scores of industries.

For the utmost economy in heavy material handling use Brownings. They will cut production costs in your plant, whether large or small, as they have for United Lead and hundreds of others. Let our engineers go over your material handling problems with you and point out where the savings are possible.

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The Babcock & Wilcox Tube Co.

(Pittsburgh Seamless Tube Co.)

Hot Finished and Cold Drawn

SEAMLESS

STEEL TUBES

Boiler—Locomotive—Mechanical

These mills have been operating over twenty years to insure an ample supply of high-grade tubes for Babcock & Wilcox boilers. The same careful selection of raw materials, close supervision of manufacture, rigid final inspection and promptness in deliveries are followed whether the tubes are made on outside order or for Babcock & Wilcox boilers.

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Super-Strength and Durability

Arcade Transmission and Material Handling Chains are built by men who are "cranks" on quality and uniformity.

Our two large eastern plants are ever ready to supply you *promptly* with a stronger and more reliable chain than has heretofore been experienced in the Malleable Chain industry. Miles of *Arcade Malleable Chain* in all usual and unusual styles and sizes are carried in stock for *immediate shipment.* Special designs of any nature whatever will be made to order in surprisingly short time.

Let our Engineers help you solve your transmission and material handling problems.
We shall be glad to serve you.

Arcade Malleable Iron Co.
Established 1850 Worcester, Mass.

Arcade Detachable Malleable Chain

YOUR AIRCO OXYGEN AND AIRCO ACETYLENE

FROM A NEARBY DISTRIBUTING STATION

Airco-Davis-Bournonville Torches and Specially Designed Welding and Cutting Machines will effect economies in your plant.

Ask your AIRCO DISTRICT OFFICE in nearest underlined city.

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Home Office: 342 Madison Avenue, New York, N. Y.

Airco Gas Plants or Warehouses in all cities shown except Los Angeles, which has Carbide and Apparatus Sales Stock only.

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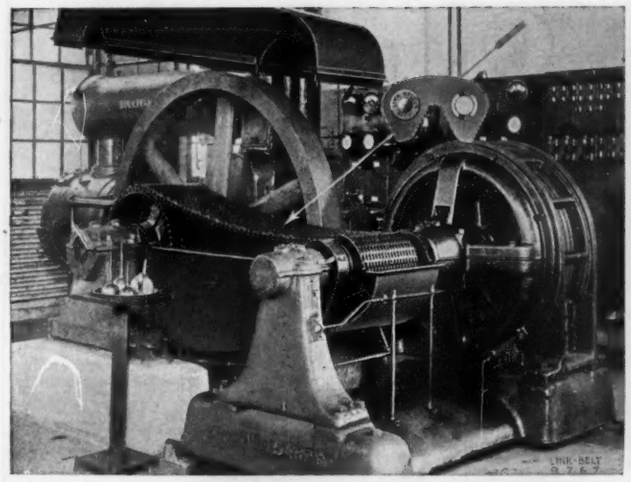

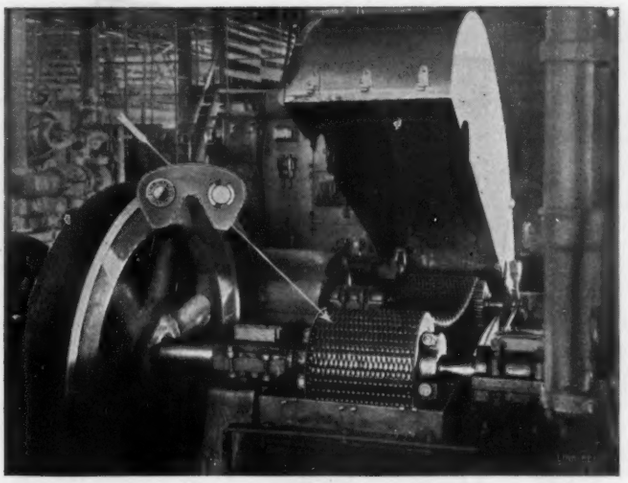

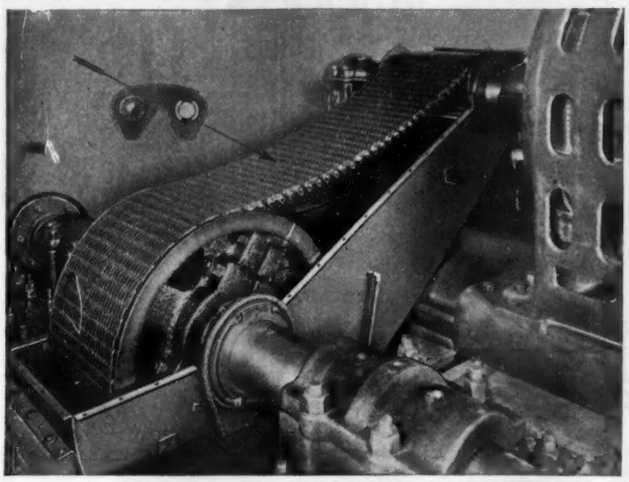

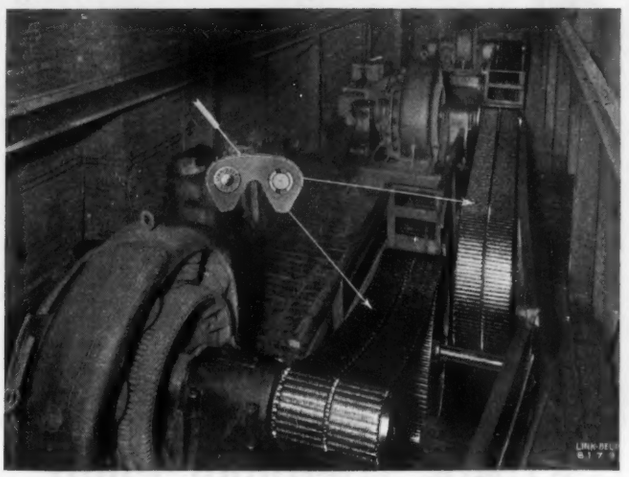

The Efficient, Effective Way to Transmit Power

CHAIN your motor to your lineshaft, or machine. Utilize the full power of your electric motor.

Drive on short centers—save space as well as power.

These illustrations show Link-Belt Silent Chain Drives in various industries. They are examples of the way hundreds of plants throughout the country are standardizing with the Link-Belt Silent Chain Drive from the prime mover to the lineshaft, or machine. There is where power waste and loss of efficiency usually starts. The ordinary flat belt is a profit-thief here.

Enclosed in an oil-retaining, dust-proof casing, the drive runs quietly, and is assured of constant lubrication. The plant is made safe for employees. It makes the ideal method of transmitting power.

Link-Belt Silent Chain Drive is 98.2% efficient on actual test. It is Flexible as a Belt—Positive as a Gear—More Efficient than Either. Made in all sizes, to suit all conditions, ¼ H. P. to 1,000 H. P. and over. For twenty years, and more, it has demonstrated its superiority over flat belts and gearing—and yet, it is practically a flexible gear.

There may be many places in your plant where you need this positive, efficient, compact, quiet drive. Learn more about it, now. Send for Data Book No. 125, which shows how to select the correct drive and figure its price.

LINK-BELT COMPANY

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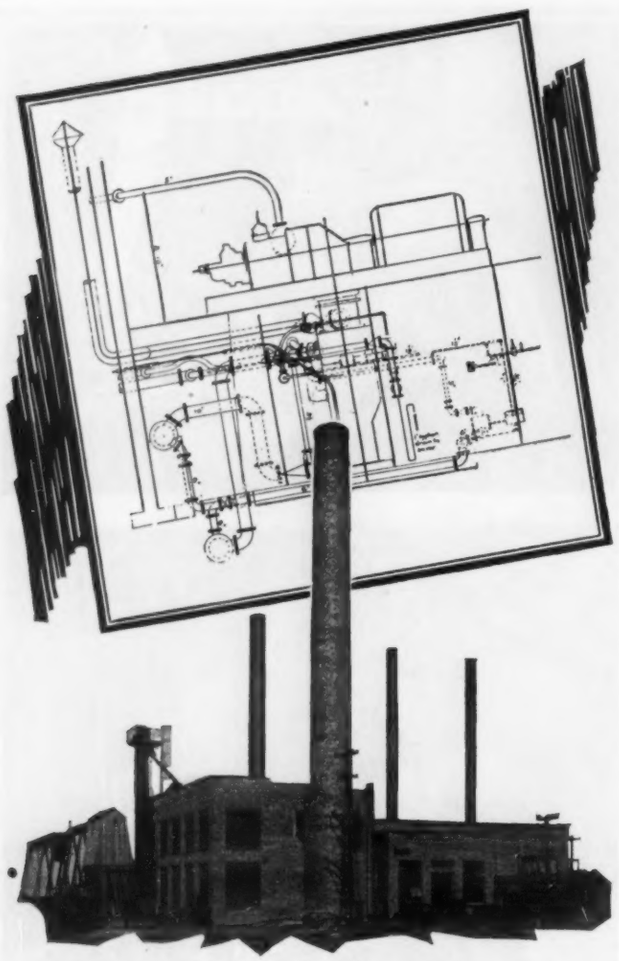
LINK-BELT

SILENT CHAIN DRIVES



At this Michigan Plant

THE piping system for the STEARNS LIGHT & POWER CO., Ludington, Mich., was designed and erected by the POWER PIPING CO. Specializing in industrial power piping service, this company is peculiarly fitted to render exceptional service, especially where an unique or unusual condition arises.

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Power Piping Co.

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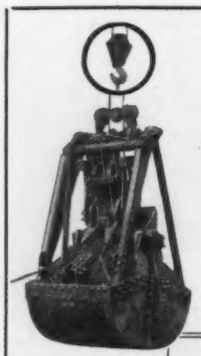
Power Piping

FOR EVERY INDUSTRIAL NEED

Complete fabrication and assembly
Valves — Flanges — Fittings



BLAW-KNOX BUCKETS ARE THE STANDARD in Construction Work, in Industrial Plants; in Railroading—WHEREVER CLAM-SHELLS ARE USED.

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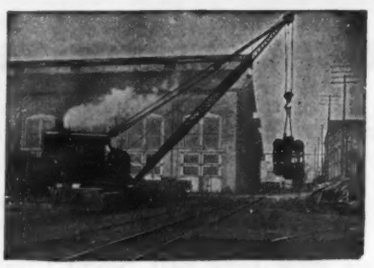

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The crane for your plant

DEPENDABLE OS LOCOMOTIVE CRANES

O. S. Dependable Crawling Tread and Road Wheel Locomotive Cranes are the standard equipment of many railroads and large corporations.

HERE'S WHY—

They are constructed of over 90% steel, and are bronze bushed throughout. The design provides for ample reserve power, accessibility and easy and convenient operation.

Our catalog tells all about our various types. Be sure to write for a copy.

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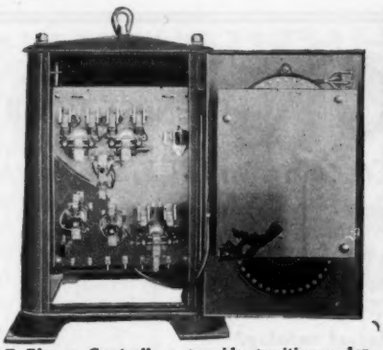
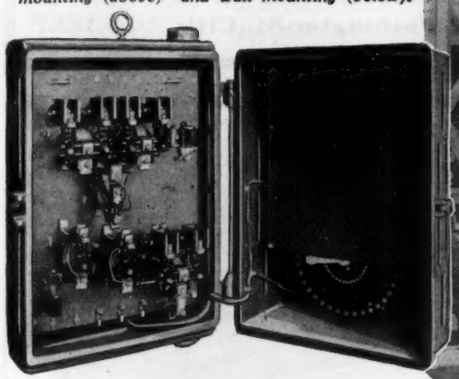
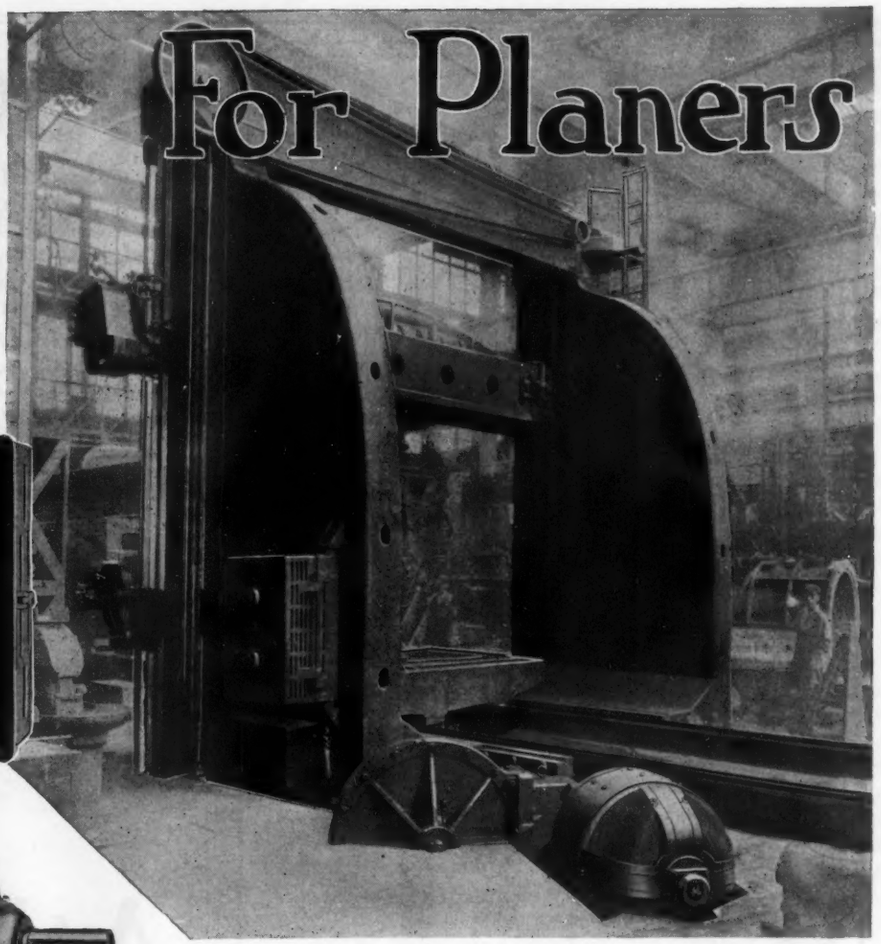
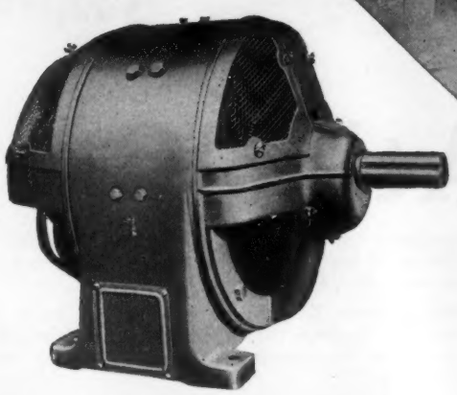




G-E Planer Controllers provide positive under-voltage and overload protection. Types for floor mounting (above)—and wall mounting (below).





G-E Type RF Direct-current Reversing Motor drive—the most highly developed drive for large planers. Over 2000 are in this service.

Dynamic Braking

with Reversing Motor equipment has these advantages

—Positive slow speed and definite stop for setting up work, without extra equipment.

—Requires less control apparatus, which lowers maintenance cost.

—Simple to operate. To bring planer to rest, throw master-switch to off-position and platen stops within definite over-travel.

—Accurate stopping, for operating current is independent of line current.

—Dynamic Braking prevents platen running off bed should line contactor remain closed from any cause.

Ask the nearest G-E Sales office for complete information on this equipment. It has many advantages over the plugging method.

When the *complete* electric equipment is built by *one* manufacturer—you get service that satisfies.

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

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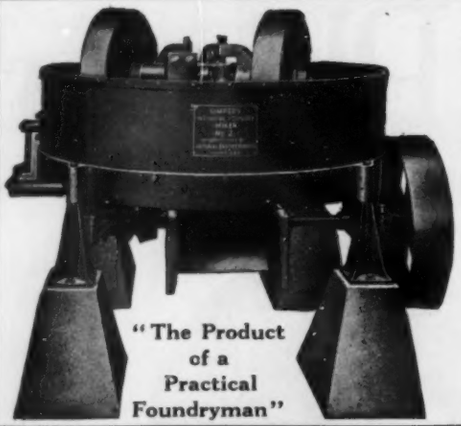
GENERAL ELECTRIC



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SIMPSON INTENSIVE FOUNDRY MIXER

Economical and Efficient for all kinds of Foundry Sand Mixtures

also for preparation of daubing to line furnaces, ovens, cupolas, etc.

It is strong and sturdy and requires the minimum operating and upkeep expense. Automatic discharge. Made in four sizes.

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Our types include ventilated rooms, Humane rotary tables, automatic tables, barrels, cabinets, hose machines—a complete line of sand blast for foundries, metal finishers, rubber mold cleaning, china scouring, etc.

Send for bulletins applicable to your class of work.

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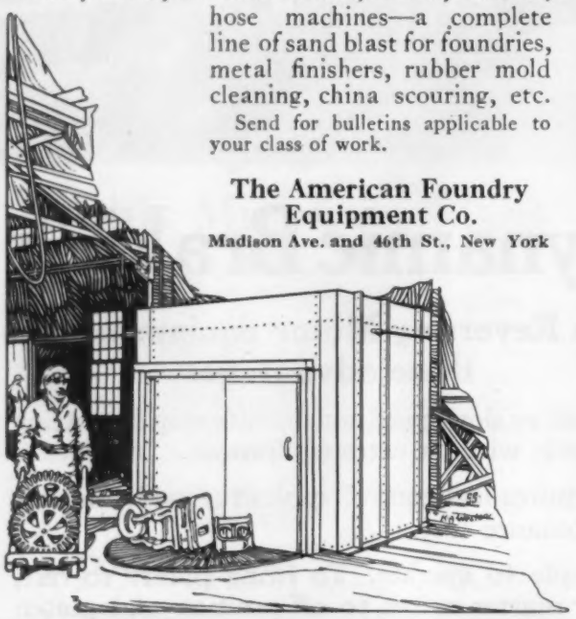

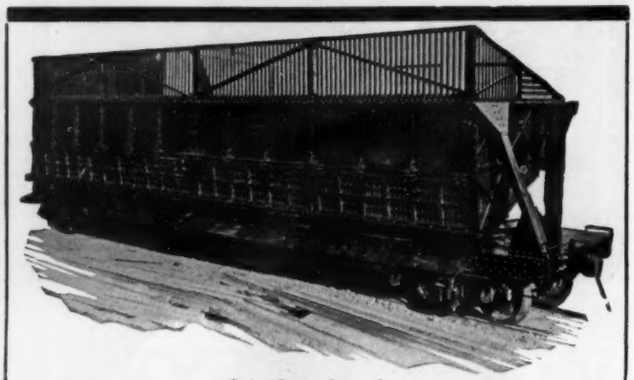

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Atlas Cars

No matter how large or small your haulage problem may be Atlas Haulage Equipment will solve it efficiently and economically.

Our engineers have spent years in the study of industrial haulage requirements and have designed the proper equipment for service, economy and durability.

The Atlas Line includes Storage Battery and Trolley Locomotives, Cranes and Cars.

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Machine Screws

SQUARE AND HEXAGON NUTS

"Promco" Quality Brands

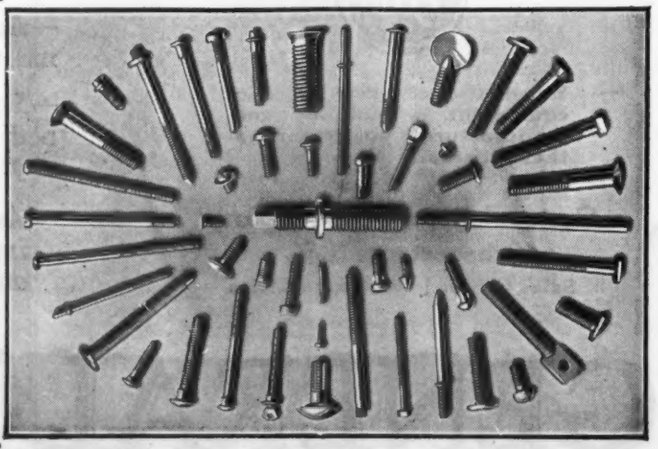
With every facility for producing a quality article and a development of a service that is unique, is only one of the many reasons for our suggesting that it may prove of benefit to you to investigate our products and become familiar with our policy.

When in the market, write us for an estimate on your requirements stating the quantity desired and a prompt estimate will be sent you.

THE PROGRESSIVE MFG. CO.

TORRINGTON, CONN., U. S. A.

The illustration indicates a few of the many special parts that we have developed for other manufacturers.



EMPIRE *New Process* BOLTS

"—Yet It Takes Hours to Make a Gauge"

The main difference between an Empire *New Process* bolt and a hardened and ground gauge is in appearance. In accuracy there is little to choose between them.

Yet it takes hours to make a gauge, and only a second or two to make an Empire New Process bolt.

But back of that "second or two" are 79 years of leadership in bolt making—accounting for the remarkable machine tool development that made the new bolt possible.

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BOLT & NUT COMPANY
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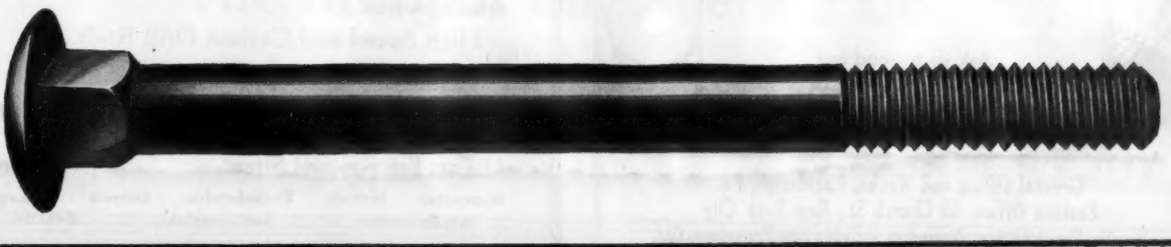
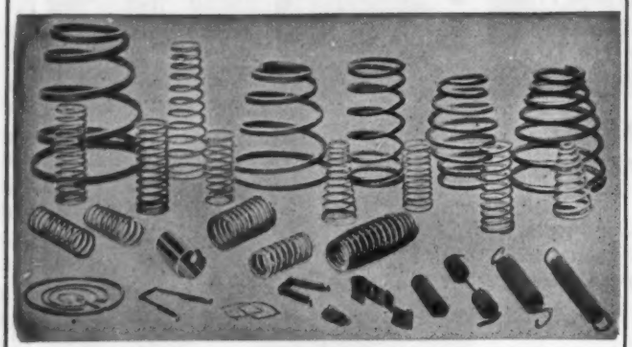


SPRINGS



Few realize, even among engineers, how much of engineering design, proper calculation of stresses, metallographic selection of materials, and scientific heat treatment, is involved in the production of a high grade spring—

We realize all these things—
AND DO THEM

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MANUFACTURERS OF ALL TYPES OF SPRINGS
COMPRESSION—EXTENSION—FLAT—TORSION
ANY SIZE ANY MATERIAL

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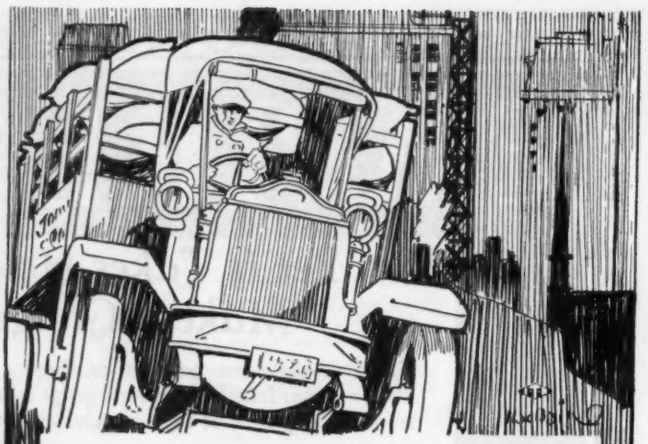

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Where dependability and reliability are essential it certainly does not pay to take chances.

The *Raymond Springs* of today are the result of 40 years of progressive experience in solving the nation's most difficult problems.

Our knowledge will prove invaluable to you.

May our Engineers solve your problems?

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Round and Shaped

FLAT COLD ROLLED STEEL

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Music Spring, Brush, Spring and other special wires.

High Speed and Carbon Drill Rods.

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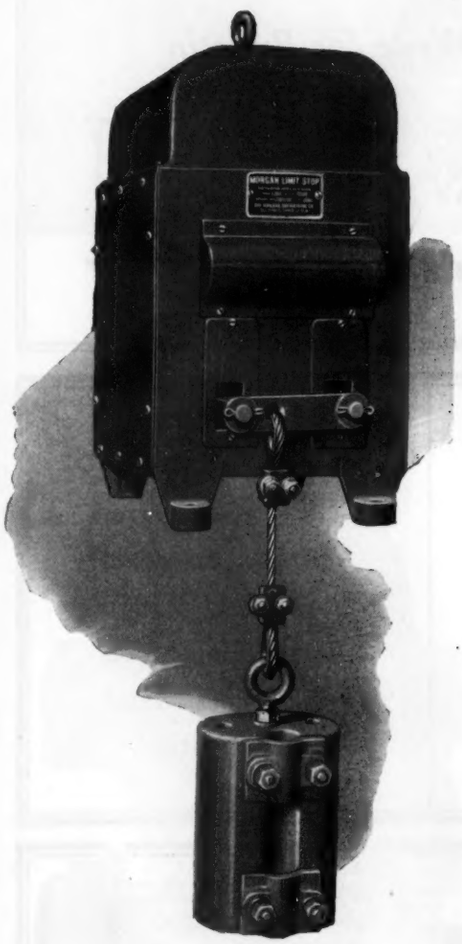
SAFETY LIMIT STOP

WACKERLY TYPE

A NEVER FAILING HOIST LIMIT STOP

For All Types of Direct Current Motors



A FEW OF THE MANY ADVANTAGES

No heavy current broken by contactors.

Limit Stop can be connected up with any standard make of controller.

No extra conductors required.

Normal lowering circuits established immediately upon reversal of controller. No waiting to lower through resistance.

No external banks of resistance. Limit Stop is self contained.

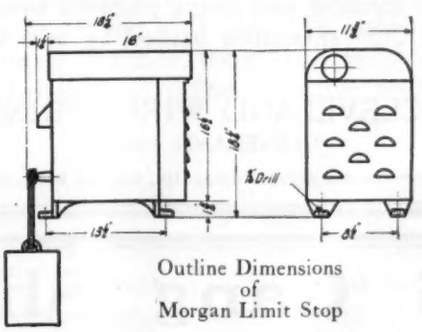
Only one swinging weight used, this being guided by one of the hoisting ropes.

Positive in action. A movement upward of weight of a fraction of an inch will actuate limit stop.

Occupies minimum floor space on trolley.

Sequence of operation of contactors obtained by simple system of levers. No cams, springs or counterweights used.

For full particulars on this stop send for Bulletin No. 29



Outline Dimensions
of
Morgan Limit Stop

A total movement of weight of less than one inch required for complete functioning of stop.

The Morgan Engineering Co.

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Designers, Manufacturers and Contractors
Electric Traveling Cranes, Rolling Mill Machinery
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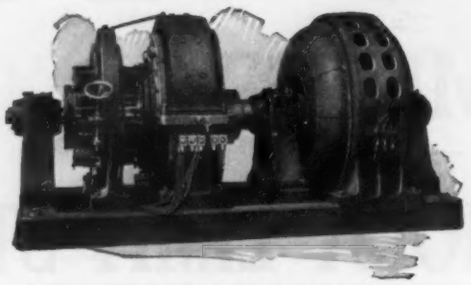
Synchronous Motor-Generator Sets



750 kw., 250/275 Volt D. C., 2200 Volt, 60 Cycle, 720 R.P.M. Synchronous Motor Generator Set.

OF ANY CAPACITY
AND FOR
ALL CLASSES OF SERVICE

Synchronous Motor can be furnished for Power Factor correction when desired.

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Turn your wire specialty and spring problems over to us in your own economy. Our specialties backed by over thirty years of experience.

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Branch Offices—Conway Bldg., Chicago, Ill., Garfield Bldg., Detroit, Mich.

Also Makers of
Steel Shop Barrels
Steel Shop Boxes
Steel Shop Shelving
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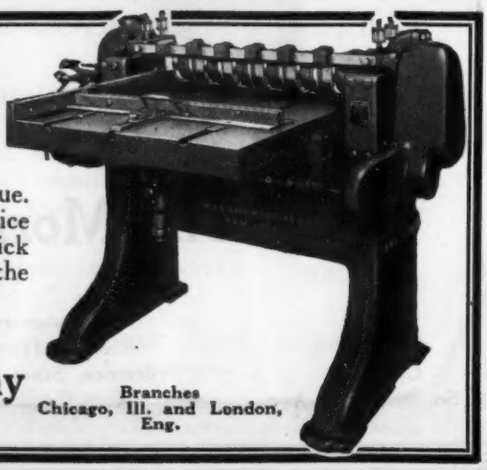
and Sheet Metal
Specialties

AMS Gang Slitter

For All Light Sheet Metals



High Speed—Labor Saving. Will trim or slit sheets Dead True. Automatic or hand feed. Double edged cutters give double service and can be ground without removing from machine. AMS Quick Adjustable Hub Clamp and many other exclusive features make it the most satisfactory machine of its kind.

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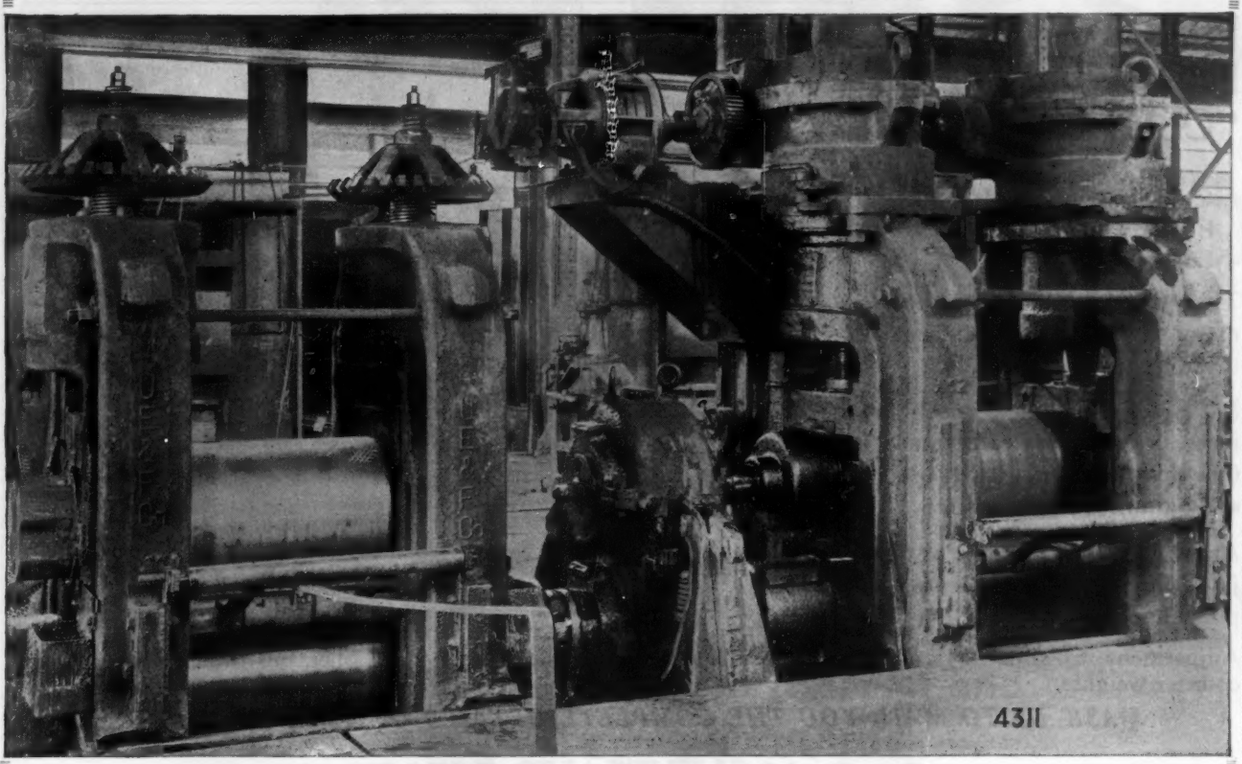
Branches Chicago, Ill. and London, Eng.



New Top Roll Drive For Balanced Sheet and Jobbing Roughing Mills

This drive replaces a pinion stand and extra set of spindles and coupling boxes; and occupies little more space than an ordinary set of spindles. In addition to the saving in space, its cost is only a fraction of that of a pinion housing and extra spindles.

The illustration at the left shows the complete drive. The illustration above shows an installation of one of these drives. Two drives installed in this plant have been in constant service for a year, and have given entire satisfaction. Note the small space required.

Let us figure on your requirements.

UNITED ENGINEERING & FOUNDRY CO.

PITTSBURGH, PA.

The World's Greatest Manufacturers of Rolls and Rolling Mill Machinery

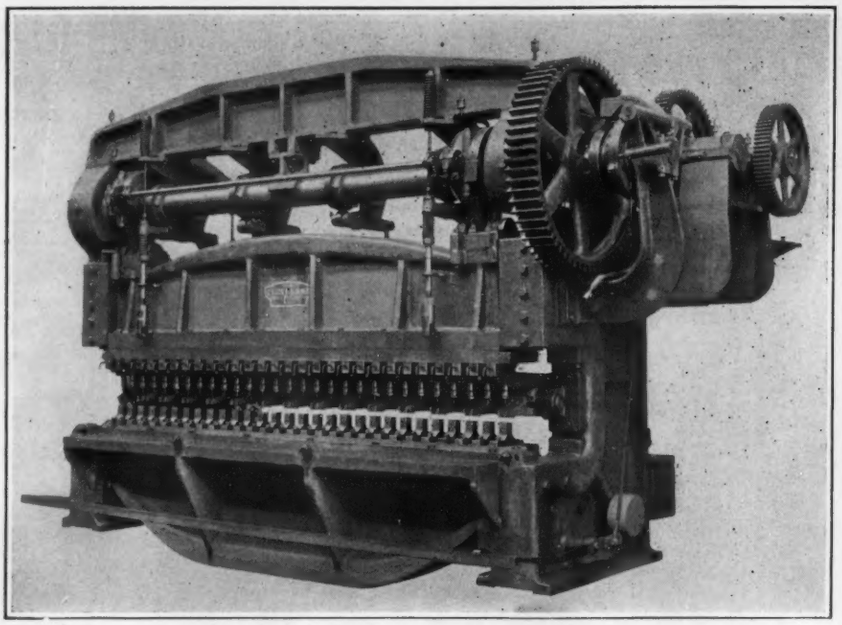
HERE'S THE LATEST "CLEVELAND"

A Combination Multiple Punch Gate Shear and Gap Forming Press

This "CLEVELAND" embodies many new and important features.

Patented single bolt gagged, adjustable punching attachment (enables one man to do the setting up).

Automatic Stripper. Positive jaw clutch for regular run of punching.



Adjustment to slide—Friction clutch for forming—Interchangeable plate Shearing attachment—Safety counter weights.

ASK US TO MAIL YOU THE COMPLETE DETAILS OF THIS MACHINE

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Main Office & Works · CLEVELAND, OHIO
PITTSBURGH - CHICAGO - PHILADELPHIA - NEW YORK

Rolling Mill Jim Says—

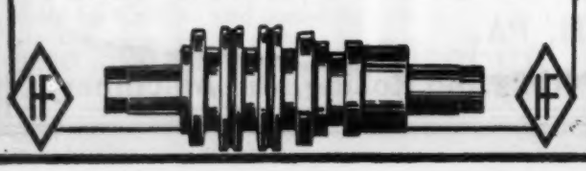
Say Fellas;

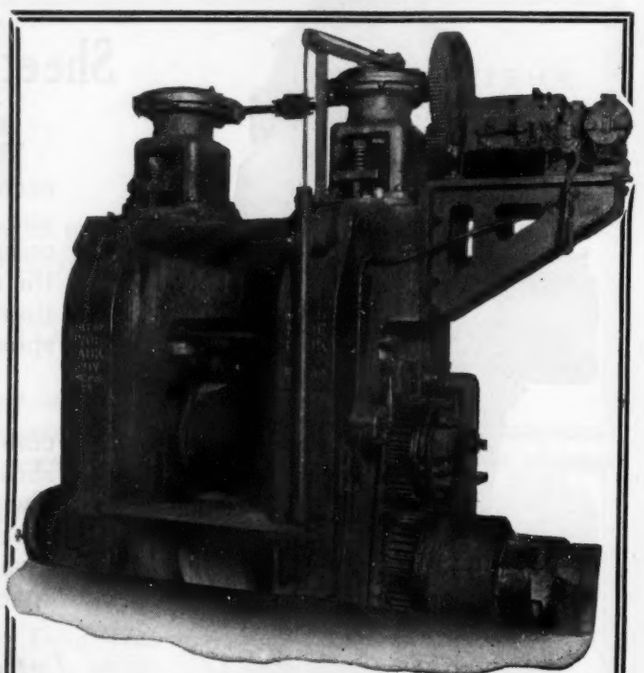
Don't forget that Better Rolls mean Better Steel—and that HUBBARD ROLLS can't be beat.

S'Long

Rolling Mill Jim

Hubbard Steel Foundry Co.
EAST CHICAGO, IND.
All Kinds of Iron and Steel Rolls and Steel Castings





29 x 44 Balanced Type Roughing Mill

"HYDE PARK" EQUIPMENT
for ROLLING MILLS and STEEL WORKS

We manufacture CHILLED ROLLS—ROLL LATHES —IRON CASTINGS—SQUARING and DOUBLING SHEARS for Sheet and Tin Mills

HYDE PARK FOUNDRY & MACHINE CO.
HYDE PARK, PA.

ADAMITE

PATENTED

THE STANDARD FOR PERFORMANCE

IN THE FIRST FOUR MONTHS OF 1924:

FOR THREE MILLS ONLY IN ONE PLANT ALONE

One of the Large Corporations in the regular course of business

PURCHASED 143 TONS

Of ADAMITE ROLLS for Special and Severe rolling requirements.

They also used Many Tons of ADAMITE Castings

ANOTHER PLANT

Of Another Large Corporation under similar circumstances

PURCHASED 113 TONS

Of ADAMITE ROLLS for their Severe Rolling Service

THE BEST MEN IN THE BEST MILLS are using Large Tonnages of ADAMITE because

ONLY ADAMITE WILL SERVE THEIR PURPOSE

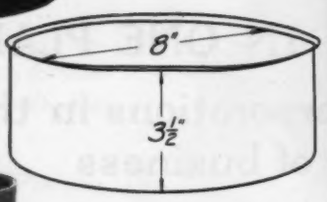
THERE IS NO COMPETITION

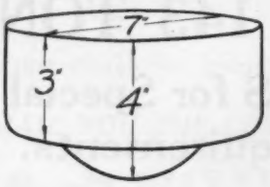
ADAMITE ROLLS AND HEAVY DUTY CASTINGS

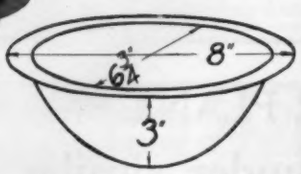
Sole Manufacturers { Mackintosh-Hemphill Co. / United Engineering & Foundry Co. } *Pittsburgh, Pa.*

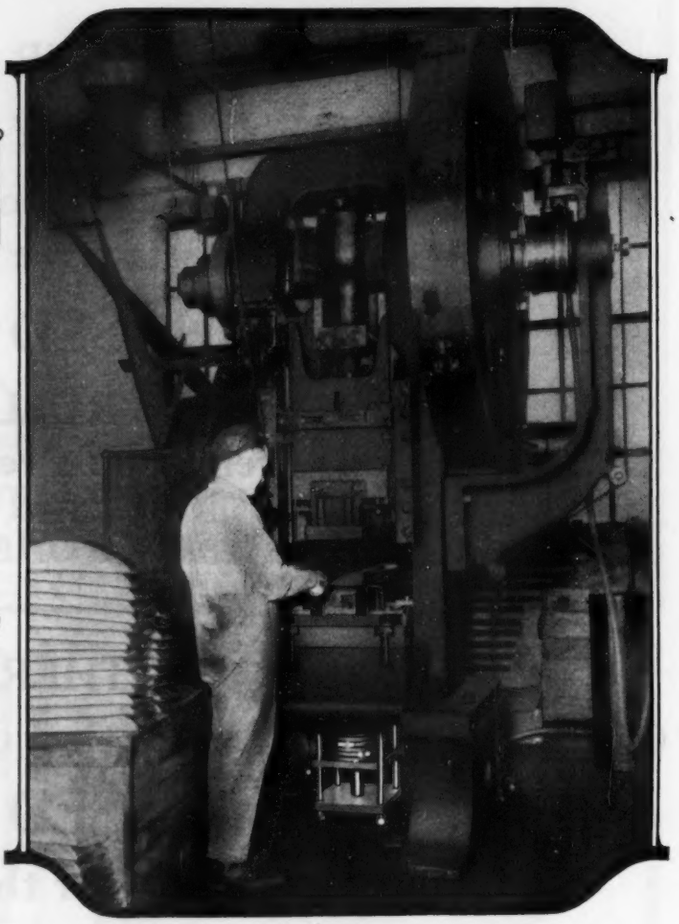
Marquette Pneumatic

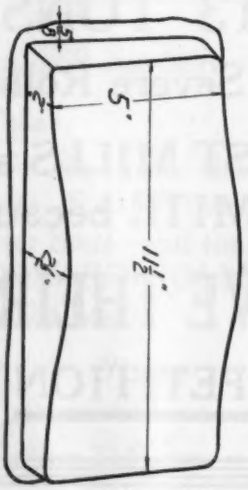
With their help one press











Marquette Tool &

319 West Ohio

Die Cushions

does the work of many

14 STAMPINGS—
Count 'Em!

AND each one done in one operation; with the same die cushion; in the same plant; on the press illustrated at left.

A jobbing shop puts out these stampings on a press equipped with the Marquette Pneumatic Die Cushions which make it easy to draw deep shells in one operation without wrinkles and tears, as well as unnecessary wear on the dies and back lash of the press.

Marquette Pneumatic Die Cushions automatically hold the blank at the right pressure during entire stroke of the press; variations in thickness of blank are automatically compensated for.

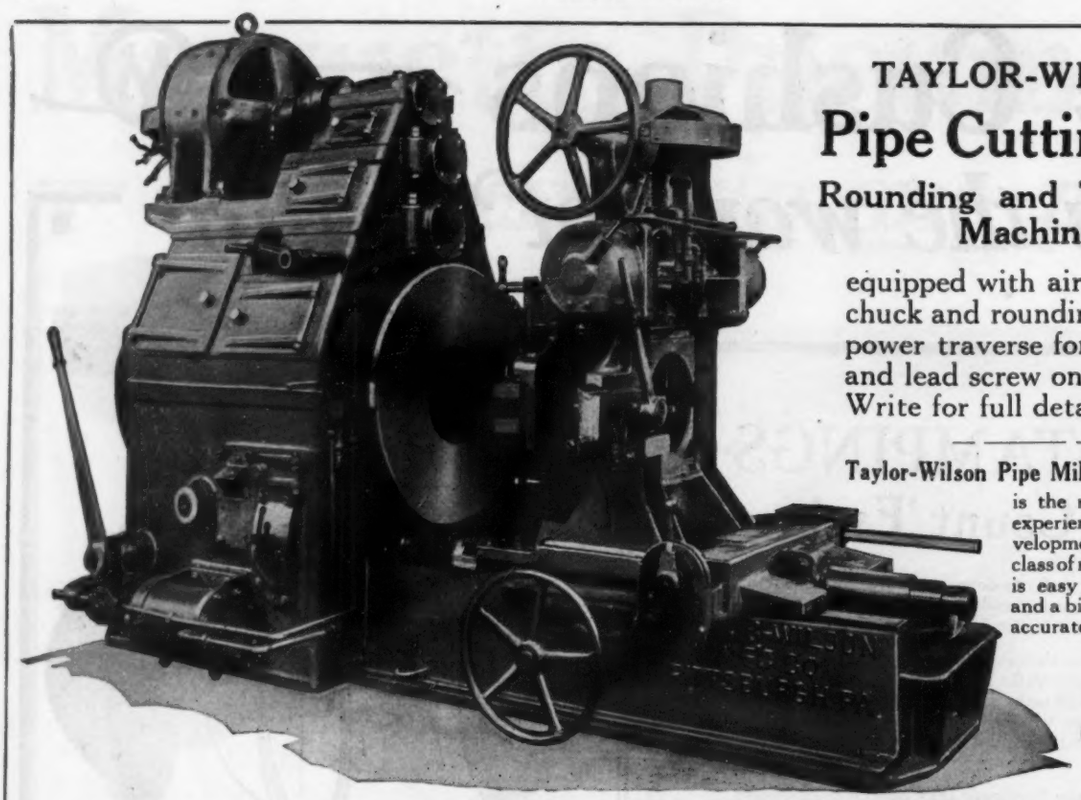
You know there's usually lots of grief in a jobbing shop. If Marquette Pneumatic Die Cushions perform so perfectly for a large variety of stampings, how much more easily they would serve those who have a standard product!

Let our pneumatic die cushions solve your stamping problems. Consult our engineering department when you have difficulties.

Marquette Tool & Manufacturing Co.
327 West Ohio Street, Chicago, Illinois, U. S. A.

2796

Manufacturing Co.
St. Chicago



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Pipe Cutting-Off

Rounding and Threading Machine

equipped with air operated chuck and rounding blocks, power traverse for carriage and lead screw on carriage. Write for full details.

Taylor-Wilson Pipe Mill Machinery is the result of long experience in the development of this class of machinery. It is easy to operate, and a big producer of accurate work.

Capacity 6" to 12½"

TAYLOR-WILSON MFG. CO

ENGINEERS – FOUNDERS – MACHINISTS

MAIN OFFICE AND WORKS: McKEES ROCKS, PA.
(PITTSBURGH DISTRICT)

"QUICKWORK"

(TRADE-MARK REGISTERED THROUGHOUT THE WORLD)

ROTARY SHEARS

MADE IN VARIOUS SIZES AND STYLES

For cutting all gauges of sheet and plate up to 1¼ inches thick used in building Ships, Boilers, Cars, Tanks and General Plate and Sheet Metal Work. Cut square or beveled edges in straight or irregular shapes, also cut rings and discs, and cut openings without starting in from side of sheet. Leaves the metal flatter than any other Rotary or Short Straight-Bladed Shear. Cuts a clean edge that requires no finishing.

Joggling and flanging rolls can be used interchangeably with the cutters.

Do Long Straight Cutting Faster Than Any Other Shear of Any Kind

Patented June 3, 1913; Aug. 26, 1919; Mar. 29, 1921. Other patents pending

One "QUICKWORK" does the work of a number of old style machines. Does it better and from two to ten times quicker

Eliminate Oxy-acetylene Cutting and Plate Planing.

WRITE FOR CATALOG No. 60.

THE QUICKWORK COMPANY

ST. MARYS, OHIO, U. S. A.

Cable Address: "QUICKWORK". All standard codes used.
New York Exhibit: Grand Central Palace.
Agent for British Isles: Oliver Machinery Co., Manchester, England.

THE JOHNSON FRICTION CLUTCH

as used in the

New No. 3½ Automatic Bilton Gear Miller

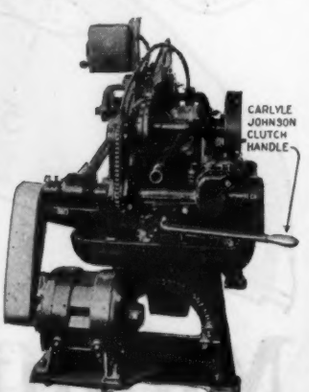
Single Clutch with Pulley Mounted

No need of using space to emphasize that Johnson Clutches embody the highest standard and quality known in friction clutch manufacture. That fact has been proven and conceded by machine tool builders throughout the country. So we'll discuss Johnson Clutch uses instead.

On this new motor drive machine a special No. 4 Single Cut-off Coupling Johnson Clutch is mounted on a short driving shaft, which is keyed to the clutch hub. When the clutch is released the short shaft and the clutch hub and cup revolve together.

Clutch Speed 550 R.P.M.

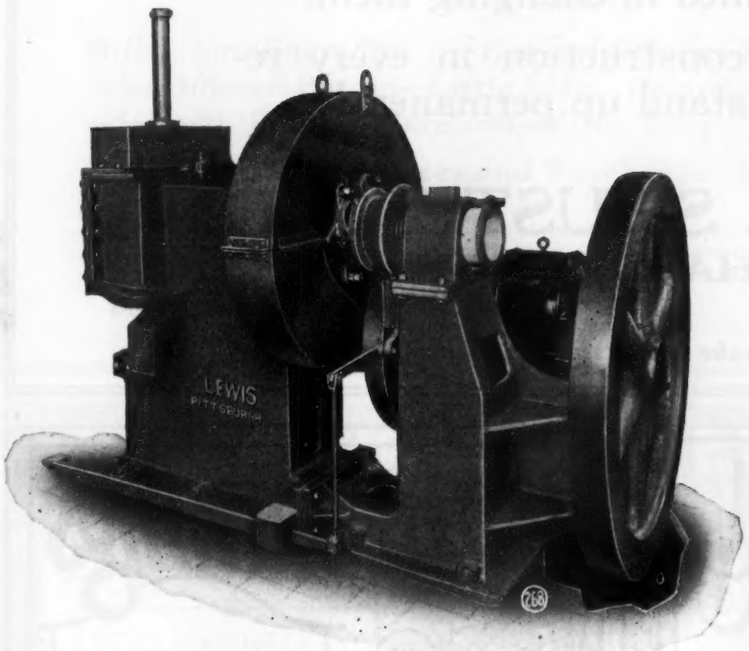
You'll be surprised at the economies resultant from Johnson installations. Save money for you in more than twenty ways. Let us advise you about these ways. *Write today for White Catalog.*



COURTESY: The Bilton Machine Tool Company, Bridgeport, Conn.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

LEWIS
BAR SHEARS



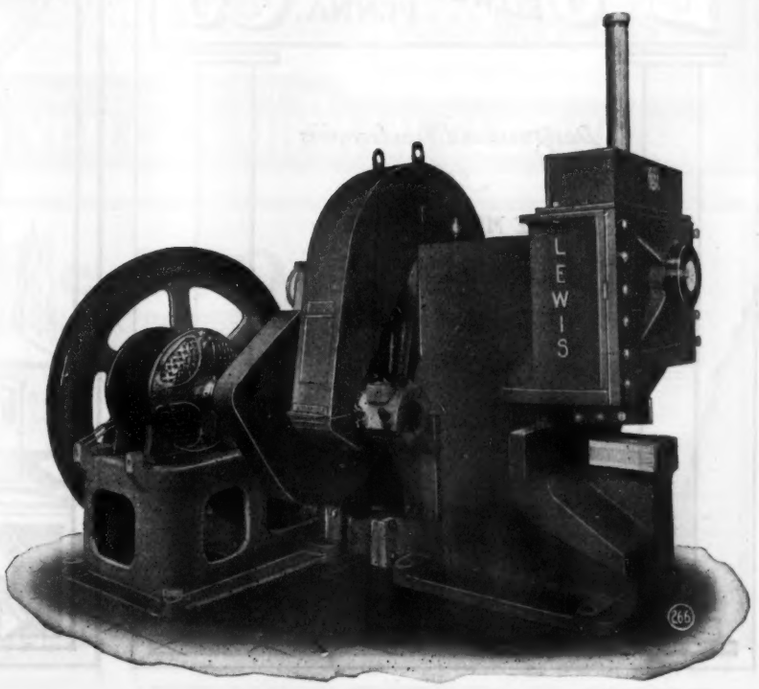
LEWIS No. 3½ SHEAR
Capacity 3½" square, mild steel

RUGGEDNESS and ACCESSIBILITY are the outstanding points of LEWIS BAR SHEARS.

Designed for hard service, long life and quick repair of wearing parts.

Shears of all sizes for all purposes.

Our experience in building shears for more than 60 years is at your disposal.



LEWIS
FOUNDRY & MACHINE CO.
1512 Farmers Bank Building
Pittsburgh, Pa.

Shuster Shape Straighteners and Cutters

for Squares, Hexagons and Flats

straighten both ways at one pass,
and cut absolutely accurate lengths.

Independent adjustment of all rolls means handling several sizes of stock in one set, saving expense of additional rolls and time consumed in changing them.

A high class construction in every respect—built to stand up permanently.

THE F. B. SHUSTER CO.

NEW HAVEN, CONN.

formerly John Adt & Son **Established 1866**

We also make round stock machines

Standard Engineering Co.

ELLWOOD CITY, PENNA.

Designers and Manufacturers
of

TUBE MILL MACHINERY
Seamless and Welded

ROLLING MILL EQUIPMENT

PIPE THREADING MACHINERY

CASTINGS
Grey Iron, Semi-Steel, Cupola and Air Furnace

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Sand and Chilled

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Special Paints for all purposes.

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DIAMOND PAINT & OIL WORKS
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—Security Bldg. Cleveland—Kirby Bldg. Philadelphia—Atlantic Bldg.
Detroit Offices and Warehouse: 6189 Hamilton Ave.

Pacific Coast Representatives: Andrew Carrigan Co., Rialto Bldg., San Francisco, Cal.
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PARK BUILDING PITTSBURGH, PA.

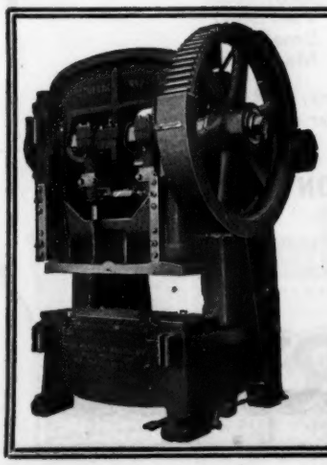
Engineers and Builders of Special Machinery

Gray Iron Castings from 1 to 8000 lbs.
Brass and Bronze Castings from 1 to 300 lbs.

Manufacturers of
Straightening Machinery For All Purposes
Best in the World
Write for Circulars

MACHINE WORK
WOOD PATTERNS

Send Blueprint for Estimating
LOWER PRICES THAN YOU CAN OBTAIN ELSEWHERE

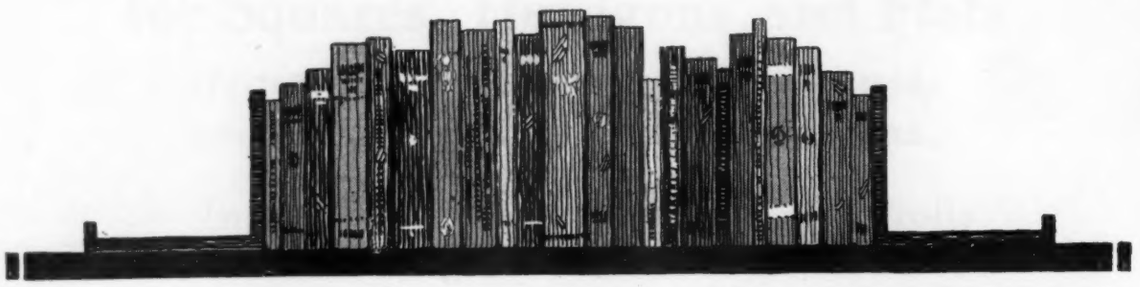


The "TOLEDO"
DOUBLE CRANK PRESSES OF KNOWN RELIABILITY

Over 250 sizes with adaptability covering practically every requirement of general sheet metal and drop forged work.
They are conspicuous for sturdy, well balanced construction, long life and accurate, economical performance.

"PRESSES FOR EVERY PURPOSE"

THE TOLEDO MACHINE & TOOL CO., Toledo, Ohio
Founders, Machinists and Engineering Specialists on Equipment for Sheet Metal Products.
Chicago Office: 549 West Washington Blvd. Detroit Office: Room 3—250 General Motors Bldg.



No group of catalogs is complete without the

"The Key to Immediate Steel"

80,000 copies of this booklet are mailed every sixty days to users of steel and steel products. It is the "key" to the largest stocks of steel in the world, including complete information on:

Bars	Tubes	Boiler Fittings
Shapes	Plates	Concrete Reinforcing
Structurals	Sheets	Firmtread Plates
Rails	Rivets	Alloy Steel
Shafting	Bolts	Tool Steel
Strip Steel	Nails	Small Tools
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If you are not receiving a copy, just ask to have your name placed on our mailing list.

JOSEPH T. RYERSON & SON INC.
ESTABLISHED 1842

PLANTS: CHICAGO ST. LOUIS CINCINNATI DETROIT BUFFALO NEW YORK
BRANCH OFFICES: DENVER HOUSTON JERSEY CITY
MILWAUKEE MINNEAPOLIS NEWARK SAN FRANCISCO TULSA

RYERSON STEEL-SERVICE

INDUSTRIAL FURNACES

The Combustion Engineering Corporation announces the addition of the

HERMANSEN PATENT RECUPERATIVE FURNACES

as one of its products. Over 10,000 HERMANSEN furnace installations are in operation in Europe today.

The fuel savings effected by HERMANSEN furnaces over present methods in general use in this country are remarkable.

An Industrial Furnace Department under the direction of Col. H. D. Savage, Vice President, has been formed to facilitate the handling of this class of business.

INDUSTRIAL FURNACE DEPARTMENT

Combustion Engineering Corporation

Combustion Engineering Bldg. — 43 Broad Street New York City

Offices in Principal Cities Throughout the World

Frederick Multiple Retort Stokers
Type E Stokers
Type D Stokers
Type K Stokers
Type H Stokers

Self-Contained Stokers
Green Chain Grate Stokers
Green Cast Iron Hoppers
Green Pressure Waterbacks
Quinn Fuel Oil Equipment

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Coxe Stokers Grieve Grates
Air Heaters
CEC Tube Scraping Device
Combusco Water Steel Conveyors

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Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Prest-O-Lite Co., Inc., The, Indianapolis, Ind.

ACETYLENE GENERATORS
Air Reduction Sales Co., 342 Madison Ave., New York City.
Oxweld Acetylene Co., Newark, N. J.

ACETYLENE IN CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York City.

ADAMITE ROLLS
American Adamite Co., The, 311 Oliver Bldg., Pittsburgh, Pa.

AGITATORS
Chapman Engineering Co., Mt. Vernon, O.
Cooper, C. & G., Co., Mt. Vernon, Ohio.

AIR COMPRESSORS—See COMPRESSORS (Air)

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Interstate Iron & Steel Co., 104 So. Michigan Ave., Chicago, Ill.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York.

ALUMINUM
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Co., Room 1942, 30 Church St., New York.

ALUMINUM (Vanadium)
Vanadium Corp. of America, 120 Broadway, New York.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

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National Wrought Iron Annealing Box Co., Washington, Pa.
Pittsburgh Malleable Iron Co., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Zanesville Malleable Co., Zanesville, Ohio.

ANTI GLARE PEPARATION
Skybryte Co., The, Keith Bldg., Cleveland, Ohio.

ARCHITECTS (Industrial)
Ferguson, H. K., Co., The, 6523 Euclid Ave., Cleveland, Ohio.

ARMOR FOR CONCRETE FLOORS
Irving Iron Works, Long Island City, N. Y.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsbugh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Ladish Drop Forge Co., Cudahy, Wis.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pollak Steel Co., Cincinnati, O.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

BALING PRESSES
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

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Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Larkin, J. K., & Co., Inc., 253 Broadway, New York City.

BANDS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Pollak Steel Co., The, Cincinnati, Ohio.
Walsh & McGee Steel Co., 2 Rector St., New York City.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1261 E. 38th St., Cleveland, O.

BARS (Alloy)
Central Steel Co., Massillon, Ohio.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Company, Hanna Bldg., Cleveland, Ohio.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Pacific Coast Steel Co., San Francisco, Cal.
Pollak Steel Co., The, Cincinnati, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Truscon Steel Co., 615 Wayne St., Detroit, Mich.
Walsh & McGee Steel Co., 2 Rector St., New York City.

BARS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Milton Mfg. Co., The, Milton, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Bourne-Fuller Co., Hanna Bldg., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Cleveland, O.
Central Steel Co., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Warehouse Co., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Milton Mfg. Co., The, Milton, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Pacific Coast Steel Co., San Francisco, Cal.
Pollak Steel Co., The, Cincinnati, O.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Walsh & McGee Steel Co., 2 Rector St., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

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Bourne-Fuller Co., Hanna Bldg., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Pacific Coast Steel Co., San Francisco, Cal.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Pollak Steel Co., The, Cincinnati, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Snead Architectural Iron Works, Louisville, Ky.
Walsh & McGee Steel Co., 2 Rector St., New York City.

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Wellman Bronze Co., The, 6017 Superior Ave., Cleveland, O.

BEARINGS (Ball)
New Departure Mfg. Co., The, Bristol, Conn.
Norma Company of America, Anable Ave., Long Island City, N. Y.
Strom Ball Bearing Mfg. Co., 4535 Palmer St., Chicago, Ill

BEARINGS (Journal)
Keystone Bronze Co., 39th St., Pittsburgh, Pa

BEARINGS (Motor)
Norma Company of America, Anable Ave., Long Island City, N. Y.

BEARINGS (Roller)
Hyatt Roller Bearing Co., Newark, N. J.
Norma Company of America, Anable Ave., Long Island City, N. Y.

BEARINGS (Thrust)
Norma Company of America, Anable Ave., Long Island City, N. Y.

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Williams, I. B., & Son, Dover, N. H.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.
Williams, I. B., & Son, Dover, N. H.

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Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

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Williams, I. B., & Son, Dover, N. H.

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Vaughn Machinery Co., The, Cuyahoga Falls, O.

BENCH LEGS (Steel)
Angle Steel Stool Co., Plainwell, Mich.

BENDING AND STRAIGHTENING MACHINES
Chambersburg Engineering Co., Chambersburg, Pa.
Cleveland Punch & Shear Works Co., Cleveland, Ohio.
Dreis & Krump Mfg. Co., 2917 S. Halsted St., Chicago, Ill

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AND
AUTOMATIC GAS PRODUCERS
See Full Page AD in First Issue Each Month.

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ROD MILLS
DRAW BENCHES
WIRE DRAWING AND
HANDLING EQUIPMENT
for Steel, Copper and Alloys
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Bradley Compact Hammer

Don't experiment with a hammer you are not *sure* will prove an efficient, honest tool. It will be cheaper for you to ask us because—

For 52 years we have made

BRADLEY HAMMERS

as hammers should be made.

Let us tell you what we know of forging. It may help.

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THOMAS MULTIPLE PUNCHES
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NEVERSLIP FLOOR CRANKS
VERTICAL BULLDOZERS
ANGLE BAR PLATE
BEATTY MACHINE & MFG. CO.
HAMMOND, IND.

MAYER Power Hammers
Noted for power, accessibility—and perfect control from the heaviest to the lightest blow. FULLY GUARANTEED against defective workmanship and material, also to give satisfactory service. Five sizes.
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Kardong Bros., Minneapolis, Minn.
Logemann Brothers Co.,
3120 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton-Abramsen Engrg. Co.,
Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Co., The, Pittsburgh, Pa.

BILLETS AND BLOOMS
Allegheny Steel Co., Pittsburgh, Pa.
American Rolling Mill Co., Middletown, O.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel Co., The, Massillon, Ohio.
Donner Steel Co., Inc.,
P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co.,
208 So. La Salle St., Chicago, Ill.
Inland Steel Co.,
First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co.,
104 S. Michigan Ave., Chicago, Ill.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co.,
Philadelphia, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The,
4320 Wissahickon Ave., Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BLANKS (Ring, Gear and Sprocket)
Akron-Selle Co., Akron, O.

BLAST FURNACES
Brassert, H. A., Inc.,
310 So. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co.,
2422 Euclid Ave., Cleveland, O.
Mt. Vernon Bridge Co., Mt. Vernon, Ohio.
Riter-Conley Co.,
Oliver Bldg., Pittsburgh, Pa.

BLOWERS
Bailey, Wm. M., Co.,
506 Bakewell Bldg., Pittsburgh, Pa.
Connersville Blower Co., The,
Connersville, Ind.
Ingersoll-Rand Co.,
11 Broadway, New York City.
Roots, P. H. & F. M., Co.,
Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.

BLOWERS (Pressure)
Spencer Turbine Co., Hartford, Conn.

BLOWPIPES (Brazing, Welding, Cutting, Etc.)
Oxweld Acetylene Co., Newark, N. J.

BLUE PRINT PAPER
Pease, C. F., Co.,
813 N. Franklin St., Chicago, Ill.

BLUE PRINTING MACHINERY
Pease, C. F., Co.,
813 N. Franklin St., Chicago, Ill.

BOILERS
Erie City Iron Works, Erie, Pa.

BOILERS AND SUPERHEATERS
Babcock & Wilcox Co., The,
85 Liberty St., New York City.
Erie City Iron Works, Erie, Pa.
Sotter Bros., Inc., Pottstown, Pa.

BOILERS (Waste Heat)
Babcock & Wilcox Co., The,
85 Liberty St., New York City.
Wickes Boiler Co., The, Saginaw, Mich.

BOILERS (Water Tube)
Babcock & Wilcox Co., The,
Beaver Falls, Pa.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES
Babcock & Wilcox Tube Co.,
85 Liberty St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Tyler Tube & Pipe Co., The, Washington, Pa.
Keating, E. F., Co.,
446-54 Water St., New York City.
Morris, Wheeler & Co.,
30th and Locust Sts., Philadelphia, Pa.
National Tube Co.,
Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
Weldless Tube Co., The, Wooster, Ohio.
Williams & Co., Inc.,
901 Pennsylvania Ave., Pittsburgh, Pa.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.
National Machinery Co., Tiffin, O.
Pawtucket Mfg. Co.,
327 Pine St., Pawtucket, R. I.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The,
Hanna Bldg., Cleveland, O.
Champion Rivet Co.,
E. 106th St. and Harvard Ave., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Illinois Steel Co.,
208 S. La Salle St., Chicago, Ill.
Maryland Bolt & Nut Co., The,
Mt. Washington, Baltimore, Md.
Milton Mfg. Co., The, Milton, Pa.
Oliver Iron & Steel Corp.,
So. 10th and Muriel Sts., Pittsburgh, Pa.
Rockford Bolt Co.,
220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co.,
Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.

BOLTS (Heat Treated)
Bethlehem Steel Co., Bethlehem, Pa.
Lake Erie Bolt & Nut Co.,
915 E. 63rd St., Cleveland, O.
Oliver Iron & Steel Corp.,
So. 10th and Muriel Sts., Pittsburgh, Pa.

BOOKS (Technical)
Penton Publishing Co., Cleveland, O.

BORING, DRILLING AND MILLING MACHINES
Pawling & Harnischfeger Co.,
Milwaukee, Wis.

BOXES (Carbonizing)
Driver-Harris Co., Harrison, N. J.

BOXES (Steel)
Cleveland Wire Spring Co., The,
1281 E. 38th St., Cleveland, O.

BRAKES (Electric)
Cutler-Hammer Mfg. Co., The,
Milwaukee, Wis.
Electric Controller & Mfg. Co.,
Cleveland, Ohio.
General Electric Co., Schenectady, N. Y.

BRAKES (Metal Forming)
Dreis & Krump Mfg. Co.,
2917 S. Halsted St., Chicago, Ill.
Streine Tool & Mfg. Co., The,
New Bremen, Ohio.

BRASS
American Brass Co.,
25 Broadway, New York
Bridgeport Brass Co., Bridgeport, Conn.
Chase Metal Works, Waterbury, Conn.
Conklin, T. E., Brass & Copper Co.,
50 Lafayette St., New York City.
Dallas Brass & Copper Co., Chicago, Ill.
Detroit Brass & Copper Co., Detroit, Mich.
Hungerford, U. T., Brass & Copper Co.,
80 Lafayette, New York City.
Hussey, C. G., & Co., Pittsburgh, Pa.
Merchant & Evans Co., Philadelphia, Pa.
Michigan Copper & Brass Co.,
Detroit, Mich
National Brass & Copper Co., The,
Lisbon, Ohio.
New England Brass Co., Taunton, Mass.
Osborne, J. A. & L. A., Cleveland, Ohio.
Richards & Co., Boston, Mass.
Rome Brass & Copper Co., Rome, N. Y.
Sandusky Foundry & Machine Co.,
Sandusky, O.
Scovill Mfg. Co., Waterbury, Conn.
Taunton-New Bedford Copper Co.,
Taunton, Mass.
Williams & Co., Inc.,
901 Pennsylvania Ave., Pittsburgh, Pa.

BRASS MILL PRODUCTS
Scovill Mfg. Co., Waterbury, Conn.

BRAZING OUTFITS
Air Reduction Sales Co.,
342 Madison Ave., New York City.

BRICK (Silica Magnesia Chrome Super-refractories)
General Refractories Co.,
117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co.,
St. Louis, Mo.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Pyro Clay Products Co., The, Oak Hill, O.
Soisson, Jos., Fire Brick Co.,
Connellsville, Pa.
Stowe-Fuller Refractories Co.,
1650 Union Trust Bldg., Cleveland, O.
Superior Silica Brick Co., Tyrone, Pa.

BRICK INSULATING—See INSULATING BRICK

BRIDGE CRANES (Ore and Coal Handling)
McMyler-Interstate Co., The, Bedford, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)
American Bridge Co.,
71 Broadway, New York City.
Belmont Iron Works,
22nd and Washington Ave., Philadelphia.
Blaw-Knox Co.,
602 Farmers Bank Bldg., Pittsburgh, Pa.
Eichleay, John, Jr., Co.,
So. 20th and Wharton, Pittsburgh, Pa.
McClintic-Marshall Co.,
Oliver Bldg., Pittsburgh, Pa.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Phoenix Bridge Co.,
20 S. 15th St., Philadelphia, Pa.
Steel Plate Products Co., Pottstown, Pa

BROACHING MACHINERY
Pawtucket Mfg. Co.,
327 Pine St., Pawtucket, R. I.

BRONZE
American Brass Co.,
25 Broadway, New York.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Metal Works, Waterbury, Conn.
Conklin, T. E., Brass & Copper Co.,
50 Lafayette St., New York City.
Dallas Brass & Copper Co., Chicago, Ill.
Detroit Brass & Bronze Co.,
Detroit, Mich.
Hungerford, U. T., Brass & Copper Co.,
80 Lafayette St., New York City.
Hussey, C. G., & Co.,
Pittsburgh, Pa.
Merchant & Evans Co.,
Philadelphia, Pa.
Michigan Copper & Brass Co.,
Detroit, Mich.
National Brass & Copper Co., The,
Lisbon, O.
New England Brass Co., Taunton, Mass.
Osborne, J. A. & L. A., Cleveland, Ohio.
Richards & Co., Boston, Mass.
Rome Brass & Copper Co., Rome, N. Y.
Sandusky Foundry & Machine Co.,
Sandusky, O.
Scovill Mfg. Co., Waterbury, Conn.
Taunton-New Bedford Copper Co.,
Taunton, Mass.

BRONZE (Manganese)
American Manganese Bronze Co.,
Holmesburg Junction, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BUCKETS (Clam Shell)
Blaw-Knox Co.,
602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E.,
223 Fourth Ave., Pittsburgh, Pa.
Browning Co., The,
E. 162nd St. and Waterloo Rd., Cleveland, O.
Hayward Co., The,
50-54 Church St., New York City.
Industrial Works, Bay City, Mich.
Williams, G. H., Co.,
611 Harbarger Lane, Erie, Pa.

BUCKETS (Clam Shell, Orange Peel, Drag Line, Grab)
McMyler-Interstate Co., Bedford, O.

BUCKETS (Drag Line)
Hayward Co., The,
50-54 Church St., New York City.

BUCKETS (Dumping)
Atlas Car & Mfg. Co.,
1100 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., Carbondale, Pa.

BUCKETS (Grab)
Brosius, Edgar E.,
223 Fourth Ave., Pittsburgh, Pa.
Brown Hoisting Machinery Co.,
4403 St. Clair Ave., Cleveland, O.
Browning Co.,
E. 162nd St., and Waterloo Rd., Cleveland, O.
Hayward Co., The,
50-54 Church St., New York City.
Industrial Works, Bay City, Mich.
Link-Belt Co., Chicago, Ill.
Orton & Steinbrenner Co.,
608 S. Dearborn St., Chicago, Ill.
Pawling & Harnischfeger Co.,
38th and National Ave., Milwaukee, Wis.
Wellman-Seaver-Morgan Co.,
7000 Central Ave., Cleveland, O.
Williams, G. H., Co.,
611 Harbarger Lane, Erie, Pa.

BUILDERS (Industrial Plants)
Ferguson, H. K., Co., The,
4900 Euclid Bldg., Cleveland, O.

BUILDINGS (Sectional Steel)
Blaw-Knox Co.,
602 Farmers Bank Bldg., Pittsburgh, Pa.

BUILDINGS (Steel)—See BRIDGES, BUILDINGS AND VIADUCTS

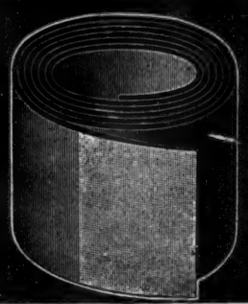
BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.
Logemann Brothers Co.,
3120 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, Ohio.

BURNERS (Acetylene)—See TORCHES AND BURNERS (Acetylene, Blow, Oxyacetylene)

BURNERS (Fuel Oil, Gas and Combination)
Davison, N. C., Gas Burner & Welding Co.,
2939 Smallman Ave., Pittsburgh, Pa
Hagan, George J., Co.,
Chamber of Commerce Bldg., Pittsburgh, Pa.
Tate, Jones & Co., Inc.,
914 Empire Bldg., Pittsburgh, Pa.

BUSINESS CARDS (Engraved)
Wiggins, John B., Co.,
705 Peoples Gas Bldg., Chicago, Ill.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



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Wire Mills Reversing Valves
(*See first issue each month for SPECIAL ANNOUNCEMENT*)
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TREADWELL ENGINEERING COMPANY
Merchant Mills—Wire Rod Mills—Continuous Mills—Hot and Cold Strip Mills—Hoisting Machinery
EASTON, PENNSYLVANIA, U. S. A.

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AMERICAN PUNCH & SHEAR WORKS ... THE QUALITY LINE
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This is the most powerful 30" shaper on the market. It has remarkable capacity for shaping out work from the solid and for removing metal. Has rapid feed change with wide range.
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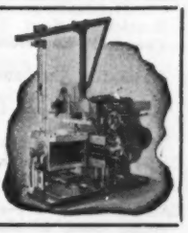
MUSKEGON HEIGHTS, MICH.



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HIT HARDER
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AND USE LESS AIR THAN ANY RIVETER MADE
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CHAMBERSBURG
Steam, Steam Drop, and Board Drop Hammers
Trimming Presses Punches and Shears
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Presses, Riveters, Pumps and Accumulators
Special Machinery Designed and Built
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Your Scrap Metal
Worth Most in Dense Bundles
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Hydraulic Scrap Bundling Presses
Write for Particulars
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CALCIUM CARBIDE
Air Reduction Sales Co.,
342 Madison Ave., New York City.

CAN MAKING MACHINERY
Ams, Max, Machine Co.,
101 Park Ave., New York City.
Bliss, E. W., Co.,
53rd St. and 2nd Ave., Brooklyn, N. Y.

CARBON BURNING APPARATUS
Oxweld Acetylene Co., Newark, N. J.

CAR DUMPERS
Link-Belt Co.,
910 S. Michigan Ave., Chicago, Ill.
Wellman-Seaver-Morgan Co.,
7000 Central Ave., Cleveland, O.

CAR DUMPERS (Coal, Ore and Ash Handling Machinery)
McMyler-Interstate Co., The, Bedford, Ohio.

CARS (Industrial)
Whiting Corp., Harvey, Ill.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co.,
1100 Ivanhoe Rd., Cleveland, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Fdy. & Machine Co.,
Birdsboro, Pa.

CASTINGS (Acid Resisting Bronze)
Bronze Die Casting Co.,
Franklin St. & Ohio River,
N. S. Pittsburgh, Pa.
Wellman Bronze Co., The,
6017 Superior Ave., Cleveland, O.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Foundry Co.,
Kedzie Ave. & E. 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The,
1220 Queen City Ave., Cincinnati, O.
Sivyer Steel Casting Co., Milwaukee, Wis.
Stroh Steel Hardening Process Co.,
Westinghouse Bldg., Pittsburgh, Pa.
Union Steel Castings Co.,
62nd and Butler Sts., Pittsburgh, Pa.

CASTINGS (Bessemer Iron)
Pennsylvania Engineering Works,
New Castle, Pa
Valley Mould & Iron Corp., Sharpsville, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
American Manganese Bronze Co.,
Holmesburg Junction, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Chemical Engineering & Foundry Co.,
Atlanta, Ga.
Evansville Aluminum & Brass Casting Co.,
Evansville, Ind.
Keystone Bronze Co.,
39th St., Pittsburgh, Pa.
Mesta Machine Co., West Homestead, Pa.

CASTINGS (Chemical)
Chemical Engineering & Foundry Co.,
Atlanta, Ga.

CASTINGS (Electric Steel)
Acme Steel & Malleable Iron Works,
Buffalo, N. Y.
Chicago Steel Foundry Co.,
Kedzie Ave. & E. 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The,
1220 Queen City Ave., Cincinnati, Ohio.
Crucible Steel Casting Co., The,
Almira and W. 84th St., Cleveland, O.
Eastern Steel Castings Co., Newark, N. J.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.
Maynard Electric Steel Castings Co.,
2-12 Kilbourn Rd., Milwaukee, Wis.
Milwaukee Steel Foundry Co.,
101-121 Water St., Milwaukee, Wis.
Pelton Steel Co., Milwaukee, Wis.
Pittsburgh Electric Furnace Corp.,
P. O. Box 1125, Pittsburgh, Pa.
Racine Steel Castings Co., Racine, Wis.
Sivyer Steel Casting Co., Milwaukee, Wis.

CASTINGS (Gray Iron)
Adamson Machine Co., The, Akron, O.
American Foundry & Const. Co.,
4700 2nd Ave., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Fdy. & Mchy. Co.,
Birdsboro, Pa.
Bonnot Co., Canton, O.
Buffalo Foundry & Machine Co.,
1543 Fillmore Ave., Buffalo, N. Y.
Cascade Foundry Co., Erie, Pa.
Chemical Engineering & Foundry Co.,
Atlanta, Ga.
Cyclops Foundry Co.,
Union Bank Bldg., Pittsburgh, Pa.
DuBois Iron Works,
800 North Brady St., DuBois, Pa.
Irvin Co., J. J., Bellwood, Pa.
Jones Foundry Co.,
301 Pine St., Meadville, Pa.
Lake Shore Engine Works, Marquette, Mich.
Link-Belt Co., Chicago, Ill.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., West Homestead, Pa.
Midvale Co., The,
4320 Wissahickon Ave., Philadelphia, Pa.
Moloch Co., The, Kaukauna, Wis.
National Roll & Foundry Co., The,
Avonmore, Pa.
Pennsylvania Engineering Works,
New Castle, Pa.
St. Louis Malleable Casting Co.,
7701 No. Conduit Ave., St. Louis, Mo.
Smith Gas Engineering Co., Dayton, O.
Standard Engrg. Co., Ellwood City, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co.,
Wheeling, W. Va.

CASTINGS (Heat Resistant)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Malleable)
Acme Steel & Malleable Iron Works, Inc.,
Buffalo, N. Y.
American Malleable Castings Association,
1900 Euclid Ave., Cleveland, O.
Arcade Malleable Iron Co.,
Muskegon Ave., Worcester, Mass.
Belle City Malleable Iron Co., Racine, Wis.
Columbus Malleable Iron Co., Columbus, O.
Danville Malleable Iron Co., Danville, Ill.
Dayton Malleable Iron Co., Dayton, O.
Decatur Malleable Iron Co., Decatur, Ill.
Frazer & Jones Co.,
351 W. Fayette St., Syracuse, N. Y.
Illinois Malleable Iron Co.,
1801 Diversey Blvd., Chicago, Ill.
Iowa Malleable Iron Co., Fairfield, Iowa.
Kalamazoo Malleable Iron Co.,
Kalamazoo, Mich.
Lakeside Malleable Castings Co.,
Racine, Wis.
Link-Belt Co.,
P. O. Box 346, Indianapolis, Ind.
Marion Malleable Iron Works, Marion, Ind.
Moline Malleable Iron Co., St. Charles, Ill.
Newark Malleable Iron Works,
Newark, N. J.
Northern Malleable Iron Co.,
St. Paul, Minn.
Northwestern Malleable Iron Co.,
Milwaukee, Wis.
Peoria Malleable Castings Co., Peoria, Ill.
Pittsburgh Malleable Iron Co.,
Pittsburgh, Pa.
Rockford Malleable Iron Works,
Rockford, Ill.
Ross-Meehan Foundries, Chattanooga, Tenn.
St. Louis Malleable Casting Co.,
7701 North Conduit Ave., St. Louis, Mo.
Symington, T. H., Co., The,
Lincoln Park Works, Rochester, N. Y.
Temple Malleable Iron & Steel Co.,
Harrison Bldg., Philadelphia, Pa.
Vermillion Malleable Iron Co.,
Hoopeston, Ill.
Wanner Malleable Castings Co.,
Hammond, Ind.
Wisconsin Malleable Iron Co.,
Milwaukee, Wis.
Zanesville Malleable Co., Zanesville, O.

CASTINGS (Manganese Steel)
Taylor-Wharton Iron & Steel Co.,
High Bridge, N. J.

CASTINGS (Monel Metal)
Pittsburgh Valve, Foundry & Construction Co.,
26th St. and A. V. R. R., Pittsburgh, Pa.

CASTINGS (Nickel Chromium)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Semisteel)
Adamson Machine Co., The Akron, O.
Buffalo Foundry & Machine Co.,
1543 Fillmore Ave., Buffalo, N. Y.
Chemical Engineering & Foundry Co.,
Atlanta, Ga.
Pennsylvania Engineering Works,
New Castle, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

CASTINGS (Steel)
Adamson Machine Co., The, Akron, O.
Allegheny Steel Co., Pittsburgh, Pa.
American Adamite Co., The,
311 Oliver Bldg., Pittsburgh, Pa.
American Steel Foundries,
410 No. Michigan Ave., Chicago, Ill.
Atlas Steel Casting Co.,
1963 Elmwood Ave., Buffalo, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Fdry. & Machine Co.,
Birdsboro, Pa.
Columbia Steel Corp.,
Balfour Bldg., San Francisco, Cal.
Commercial Steel Castings Co., The,
Marion, O.
Crucible Steel Casting Co., The,
Almira and W. 84th St., Cleveland, O.
Eastern Steel Castings Co., Newark, N. J.
Farrell-Cheek Steel Foundry Co.,
Sandusky, O.
Federal Steel Foundry Co., Chester, Pa.
Hadfield-Penfield Steel Co., Bucyrus, Ohio.
Hubbard Steel Fdry. Co., E. Chicago, Ind.
Irvin Co., J. J., Bellwood, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Maynard Electric Steel Castings Co.,
2-12 Kilbourn Rd., Milwaukee, Wis.
Mesta Machine Co., West Homestead, Pa.
Midvale Co., The,
4320 Wissahickon Ave., Philadelphia, Pa.
Milwaukee Steel Foundry Co.,
101-121 South Water St., Milwaukee, Wis.
National Roll & Foundry Co., The,
Avonmore, Pa.
Ohio Steel Foundry Co., The, Springfield, O.
Otis Steel Co., The,
Leader News Bldg., Cleveland, Ohio.
Pelton Steel Co., Milwaukee, Wis.
Racine Steel Castings Co., Racine, Wis.
Reading Steel Casting Co., Reading, Pa.
Reliance Steel Casting Co.,
28th and Smallman Sts., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sharon Foundry Co., Sharon, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Smith, George H., Steel Casting Co.,
Milwaukee, Wis.
Stroh Steel Hardening Process Co.,
Westinghouse Bldg., Pittsburgh, Pa.
Strong Steel Foundry Co.,
33 Norris St., Buffalo, N. Y.
Union Steel Casting Co.,
62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
West Steel Castings Co., Cleveland, O.
Wheeling Mold & Foundry Co.,
Wheeling, W. Va.

CAST IRON PIPE
Chemical Engineering & Foundry Co.,
Atlanta, Ga.
United States Cast Iron Pipe & Fdry Co.,
Burlington, N. J.

CASTORS (Plate Mill) — See PLATE CASTORS

CEMENT MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CEMENT (High Temperature)
Harbison-Walker Refractories Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co.,
St. Louis, Mo.
Quigley Furnace Specialties Co.,
26 Cortlandt St., New York City.
Savage Mountain Fire Brick Co.,
Frostburg, Md.

CEMENT KILNS (Rotary Liners and Brick)
Laclede-Chirsty Clay Products Co.,
St. Louis, Mo.

CENTER PLATES (Railroad)
Transue & Williams Steel Forging Corp.,
Alliance, O.

CENTRAL STATION EQUIPMENT
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
E. Pittsburgh, Pa.

CHAIN DRIVES
Arcade Malleable Iron Co.,
Muskegon Ave., Worcester, Mass.
Baldwin Chain & Mfg. Co., Worcester, Mass.
Link-Belt Co., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

CHAINS (Conveying)
Baldwin Chain & Mfg. Co., Worcester, Mass.

CHAINS (Power Transmission)
Baldwin Chain & Mfg Co., Worcester, Mass.
Link-Belt Co.,
910 S. Michigan Ave., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

CHANNELS—See STEEL (Structural)

CHAPLETS
Erdle Perforating Co.,
171 York St., Rochester, N. Y.

CHARCOAL
Hillman Coal & Coke Co.,
First National Bank Bldg., Pittsburgh, Pa.

CHEMICALS
Ford, J. B., Co., The, Wyandotte, Mich.

CHISEL BLANKS
Cleveland Steel Tool Co., The,
660 E. 82nd St., Cleveland, O.
Hunter Saw & Machine Co.,
57th and Butler Sts., Pittsburgh, Pa.
Marchant, George F., Co.,
1434 S. Rockwell St., Chicago, Ill.

CHROME ORE (Special Furnace)
Harbison-Walker Refractories Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

CHROME VANADIUM STEEL (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

CHROMIUM
Browne, DeCourcy, Inc.,
8 West 40th St., New York City.

CHROMIUM METAL
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.

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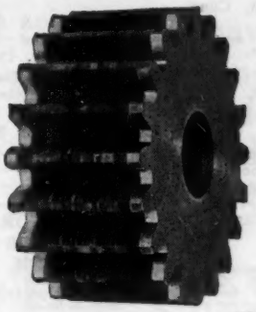

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Cleveland, Ohio		Winnipeg, Man., Can.

2150-30

CHUCKS (Lathe)
Whiton, D. E., Mach. Co., New London, Conn.

CLEANER (Metal)
Ford, J. B., Co., The, Wyandotte, Mich.

CLEANING SPECIALTIES
Ford, J. B., Co., The, Wyandotte, Mich.

CLUTCHES
Eastern Machinery Co., The, 48 Gregory St., New Haven, Conn.
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

CLUTCHES (Cut-Off Coupling)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Friction)
Eastern Machinery Co., The, 48 Gregory St., New Haven, Conn.
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES, (Magnetic)
Magnetic Mfg. Co., 278 Twenty-fourth Ave., Milwaukee, Wis.

COAL AND COKE
Addy, Matthew Co., The, Cincinnati, O.
Agnew, Batteiger & Co., 1642 Widener Bldg., Philadelphia, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Crocker Bros., 21 E. 40th St., New York.
Eaton, Rhodes & Co., Cincinnati, O.
Hanna, The M. A. Co., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Irwin Fuel Co., First National Bank Bldg., Latrobe, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., 1315 Walnut St., Philadelphia, Pa.
Rogers, Brown & Co., Cincinnati, O.
Runyon, W. C., & Co., 350 Madison Ave., New York City.
Snyder, W. P., Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

COAL CRUSHERS AND PULVERIZERS
Bartlett & Snow, C. O., Co., Cleveland, O.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.

COAL, ORE AND ASH HANDLING MACHINERY
Bartlett & Snow, C. O., Co., Cleveland, O.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Industrial Works, Bay City, Mich.
Link-Belt Co., Chicago, Ill.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.
Wellman-Seaver-Morgan Co., 7000 Central Ave., Cleveland, O.

COAL (Smithing)
Rogers, Brown & Co., Cincinnati, O.

COBALT
Browne, DeCourcy, Inc., 8 West 40th St., New York City.

COILS (Pipe)
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna, Pittsburgh, Pa.

COKE (See COAL AND COKE)

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1100 Ivanhoe Rd., Cleveland, O.

COKE OVENS (By-Product)
Koppers Co., The, Pittsburgh, Pa.

COLD STRIP MACHINERY
Blake & Johnson Co., The, 185 N. Elm St., Waterbury, Conn.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.
Spencer Turbine Co., Hartford, Conn.

COMPRESSORS (Gas)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONCRETE ARMORING (Surface)
Irving Iron Works, Long Island City, N. Y.

CONCRETE INSERTS
Dayton Malleable Iron Co., Dayton, O.

CONCRETE MIXERS—See MIXERS (Concrete)

CONDENSERS
Chapman Engineering Co., The, Mt. Vernon, O.
Cooper, C. & G., Co., Mt. Vernon, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONNECTING RODS
Leard, Wm., Co., The, New Brighton, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Electric)
Cutler-Hammer Mfg Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.

CONVEYORS (Elevating and Conveying)
Bartlett & Snow Co., C. O., Cleveland, O.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., Chicago, Ill.

COOLING BEDS
Morgan Construction Co., Worcester, Mass.

COPPER
American Brass Co., 25 Broadway, New York.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Metal Works, Waterbury, Conn.
Conklin, T. E., Brass & Copper Co., 50 Lafayette St., New York City.
Dallas Brass & Copper Co., Chicago, Ill.
Detroit Brass & Bronze Co., Detroit, Mich.
Hungerford, U. T., Brass & Copper Co., 80 Lafayette St., New York City.
Hussey, C. G., & Co., Pittsburgh, Pa.
Merchant & Evans Co., Philadelphia, Pa.
Michigan Copper & Brass Co., Detroit, Mich.
National Brass & Copper Co., The, Lisbon, Ohio.
New England Brass Co., Taunton, Mass.
Osborne, J. A. & L. A., Cleveland, Ohio.
Richards & Co., Boston, Mass.
Rome Brass & Copper Co., Rome, N. Y.
Sandusky Foundry & Machine Co., Sandusky, O.
Scovill Mfg. Co., Waterbury, Conn.
Taunton-New Bedford Copper Co., Taunton, Mass.

COPPER AND BRASS (Drawing Machinery)
Vaughn Machinery Co., The, Cuyahoga Falls, O.

CORE MAKING MACHINES
American Foundry Equipment Co., Madison Ave and 46th St., New York City.

CORRUGATING AND CRIMPING MACHINES (Cold Rolled)
Streine Tool & Mfg. Co., The, New Bremen, Ohio.

COTTER PINS
Hindley Mfg. Co., John St., Valley Falls, R. I.

COUNTERBORES AND COUNTERSINKS
Cleveland Twist Drill Co., The, Lakeside Ave. and E. 49th St., Cleveland, Ohio.

COUNTING MACHINES
Durant Mfg. Co., 655 Buffum St., Milwaukee, Wis.
Veeder Mfg. Co., Hartford, Conn.

COUPLINGS (Carriage)
Bradley, C. C., & Son, Inc. 432 N. Franklin St., Syracuse, N. Y.

CRANES (Charging)
Alliance Machine Co., Alliance, O.
Morgan Engineering Co., The, Alliance, O.

CRANES (Crawling, Tractor, Etc.)
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Industrial Works, Bay City, Mich.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
McMyler-Interstate Co., Bedford, O.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.
Pawling & Harnischfeger Co., 38th and National Ave., Milwaukee, Wis.

CRANES (Electric Traveling)
Alliance Machine Co. Alliance, O.
Box, Alfred Co., Janney & E. Ontario St., Philadelphia, Pa.
Cleveland Crane & Engrg. Co., The, Wickliffe, O.
Erie Steel Construction Co., The, Erie, Pa.
Milwaukee Elec. Crane & Mfg. Co., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, 218 Chene St., Detroit, Mich.
Pawling & Harnischfeger Co., Milwaukee, Wis.
Payne, N. B., & Co., 26 Cortlandt St., New York City.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Whiting Corporation, Harvey, Ill.

CRANES (Gantry)
Cleveland Crane & Engrg. Co., The, Wickliffe, O.

CRANES (Hand)
Armington Engrg. Co., The, Euclid, O.
Cleveland Crane & Engineering Co., The, Wickliffe, O.
Payne, N. B., & Co., 26 Cortlandt St., New York City.
Whiting Corp., Harvey, Ill.

CRANES (Hydraulic)
Alliance Machine Co., Alliance, O.

CRANES (Industrial)
Cleveland Crane & Engineering Co., The, Wickliffe, O.

CRANES (Jib)
Cleveland Crane & Engineering Co., The, Wickliffe, O.

CRANES (Locomotive)
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Browning Co., The, E. 162nd St. and Waterloo Rd., Cleveland, O.
Industrial Works, Bay City, Mich.
King, Philip T., 30 Church St., New York City.
Link-Belt Co., Chicago, Ill.
McMyler-Interstate Co., Bedford, O.
Orton & Steinbrenner Co., 608 S. Dearborn St., Chicago, Ill.
Pawling & Harnischfeger Co., 38th and National Aves., Milwaukee, Wis.

CRANES (Pillar)
Whiting Corp., Harvey, Ill.

CRANES (Portable)
Beatty Machine & Mfg. Co., Hammond, Ind.
Pawling & Harnischfeger Co., 38th and National Aves., Milwaukee, Wis.

CRANES (Wall)
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.

CRANK SHAFTS
Ladish Drop Forge Co., Cudahy, Wis.
Leard, Wm., Co., The, New Brighton, Pa.
Moltrup Steel Products Co., The, Beaver Falls, Pa.
Pollak Steel Co., The, Cincinnati, O.
Standard Gauge Steel Co., Beaver Falls, Pa.
Titusville Forge Co., Titusville, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.

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Whiting Corp., Harvey, Ill.

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Vanadium Corp. of America, 120 Broadway, New York City.

CUTTERS (Keyway)
Morton Mfg. Co., Muskegon Heights, Mich.

CUTTING AND WELDING APPARATUS—See WELDING AND CUTTING APPARATUS (Electric)

CUTTING AND WELDING (Oxy-Acetylene Process—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

CYLINDERS (Acetylene)—See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen)—See OXYGEN IN CYLINDERS

CYLINDERS (Pressure)
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

DECARBONIZING APPARATUS
Oxweld Acetylene Co., Newark, N. J.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Braeburn Alloy Steel Corp., Braeburn (Pittsburgh District), Pa.
Heppenstall Forge & Knife Co., Pittsburgh, Pa.

DIE CUSHIONS (Pneumatic)
Marquette Tool & Mfg. Co., 321 W. Ohio St., Chicago, Ill.

DIE MAKERS ACCESSORIES
Danly Machine Specialties, Inc., 4915 Lincoln Ave., Chicago, Ill.

DIES
Bethlehem Steel Co., Bethlehem, Pa.
Richards, I. P., Co., Providence, R. I.
Toledo Machine & Tool Co., Toledo, O.
Vanadium Corp. of America, 120 Broadway, New York City.

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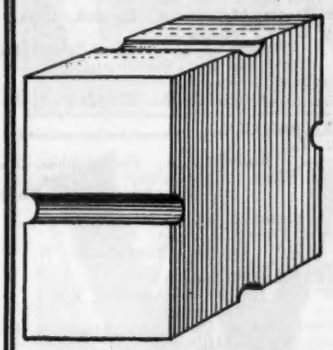

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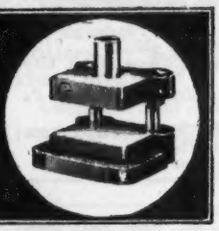

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Cleveland Office: 941 Engineers Bldg.

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FLINT SHOT
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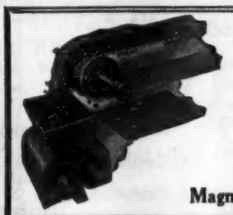
122 South Michigan Ave. Chicago



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FOR CUTTING, WELDING, ETC.

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Milwaukee, Wis.

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Marchant, George F., Co.,
1434 Rockwell St., Chicago, Ill.

DOORS AND SHUTTERS (Steel, Fire and Rolling)
Kinnear Manufacturing Co.,
818-868 Field Ave., Columbus, O.

DRAFTING ROOM FURNITURE
Pease, C. F., Co.,
813 N. Franklin St., Chicago, Ill.

DRAW BENCHES
Standard Engineering Co., Ellwood City, Pa.
Vaughn Machinery Co., The,
Cuyahoga Falls, O.

DRAWING INSTRUMENTS (American Made)
Pease, C. F., Co.,
813 N. Franklin St., Chicago, Ill.

DRAWING TABLES
Economy Drawing Table & Mfg. Co.,
Adrian, Mich.

DRILLS
Cleveland Twist Drill Co., The,
Lakeside Ave. and E. 49th St.,
Cleveland, O.

DRILL SOCKETS
Cleveland Twist Drill Co., The,
Lakeside Ave. and E. 49th St.,
Cleveland, O.

DRILLS (Electric)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.

DRILLS (Pneumatic)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.
Cleveland Pneumatic Tool Co.,
3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co.,
11 Broadway, New York City.

DRILLS (Rock)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.
Ingersoll-Rand Co.,
11 Broadway, New York City.

DRILLS (Twist)
Cleveland Twist Drill Co.,
Lakeside Ave. and E. 49th St.,
Cleveland, Ohio.

DRIVES (Cut Herringbone Gears)
Farrel Foundry & Machine Co.,
344 Vulcan St., Buffalo, N. Y.
Lewis Foundry & Machine Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett & Snow, C. O., Co., Cleveland, O.
Duff Patents Co., Inc.,
321 Union Trust Bldg., Pittsburgh, Pa.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.
General Electric Co., Schenectady, N. Y.

ELECTRIC HEATERS (for Rivets, Bolts, Drop Forgings, Rods)
American Car & Foundry Co.,
165 Broadway, New York City.

ELECTRIC HEATING APPARATUS
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

ELECTRIC TOOLS (Portable)—See TOOLS (Portable Electric)

ELEVATORS (Bucket)
Bartlett & Snow, C. O., Co., Cleveland, O.
Link-Belt Co., Chicago, Ill.

END MILLS
Cleveland Twist Drill Co., The,
Lakeside Ave. and E. 49th St.,
Cleveland, O.

ENGINE LATHES—See LATHES (Engine)

ENGINEERS AND CONTRACTORS
Brassert, H. A., Inc.,
310 So. Michigan Ave., Chicago, Ill.
Ferguson, H. K., Co., The,
6523 Euclid Ave., Cleveland, O.
Freyn, Brassert & Co.,
310 So. Michigan Ave., Chicago, Ill.
Hagan, George J., Co.
Chamber of Commerce Bldg.,
Pittsburgh, Pa.
Chapman Engineering Co., Mt. Vernon, O.
Kennedy, Julian,
Bessemer Bldg., Pittsburgh, Pa.
Laughlin, Alex, & Co.,
First National Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
McClure, Geo. W., Son & Co.,
Pittsburgh, Pa.
McKee, Arthur G., & Co.,
2422 Euclid Ave., Cleveland, O.
Moore, W. E., & Co.,
Union Bank Bldg., Pittsburgh, Pa.
Phoenix Bridge Co.,
20 South 15th St., Philadelphia, Pa.
Pittsburgh Valve, Fdry. & Construction Co.,
26th St. & A. V. Ry., Pittsburgh, Pa.
Smythe, S. R., Co., The, Pittsburgh, Pa.
Sutton-Abramsen Engineering Co.,
Park Bldg., Pittsburgh, Pa.
Swindell, Wm., & Bros.,
P. O. Box 1753, Pittsburgh, Pa.

ENGINEERS (Consulting)
Brassert, H. A., Inc.,
310 So. Michigan Ave., Chicago, Ill.
Ellis, Frank I.,
2127 Farmers Bank Bldg., Pittsburgh, Pa.
Ensign & Snow,
517 National City Bank Bldg., Cleveland, O.
Ferguson, H. K., Co., The,
4900 Euclid Bldg., Cleveland, O.
Freyn, Brassert & Co.,
310 So. Michigan Ave., Chicago, Ill.
Kennedy, Julian,
Bessemer Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co.,
2422 Euclid Ave., Cleveland, O.
Moore, W. E., & Co.,
Union Bank Bldg., Pittsburgh, Pa.
Perin, C. P., Marshall, S. M.,
1107 Broadway, New York City.
Shover, Barton R.,
424 Oliver Bldg., Pittsburgh, Pa.

ENGINEER, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Co., The, Pittsburgh, Pa.

ENGINES (Gas, Oil)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.
Ingersoll-Rand Co.,
11 Broadway, New York City.

ENGINES (Gasoline)
Bailey, Wm. M., Co.,
506 Bakewell Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co.,
7000 Central Ave., Cleveland, O.

ENGINES (Heavy Duty)
Mesta Machine Co., West Homestead, Pa.

ENGRAVERS (Steel and Copper Plate)
Wiggins, John B., Co.,
795 Peoples Gas Bldg., Chicago, Ill.

EXHAUSTERS (Gas)—See GAS EXHAUSTERS

EXPANDED AND PERFORATED METAL
McCalla, Harold, Co., The,
Beach St. and E. Columbia Ave.,
Philadelphia, Pa.

FENCE (Chain Link)
Wickwire Spencer Steel Corp.,
41 E. 42nd St., New York City.

FENCES—See WIRE FENCES

FERROALLOYS
Browne, deCourcy, Inc.,
8 West 40th St., New York City.
Cleveland-Cliffs Iron Co.,
Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co.,
30 Church St., New York City.
Metal & Thermit Corp.,
120 Broadway, New York City.
Park & Williams, Inc., Philadelphia, Pa.

FERROCARBON TITANIUM
Titanium Alloy Mfg. Co.,
Niagara Falls, N. Y.

FERROCHROME
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co.,
Harrison Bldg., Philadelphia, Pa.

FERROMANGANESE
Agnew, Batteiger & Co.,
1642 Widener Bldg., Philadelphia, Pa.
Crocker Bros.,
21 E. 40th St., New York City.
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co.,
30 Church St., New York City.
Rogers, Brown & Co., Cincinnati, O.
Samuel, Frank, & Co.,
Harrison Bldg., Philadelphia, Pa.

FERROSILICON
Crocker Brothers,
21 E. 40th St., New York City.
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Rogers, Brown & Co., Cincinnati, O.
Samuel, Frank, & Co.,
Harrison Bldg., Philadelphia, Pa.

FERROVANADIUM
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Vanadium Corp. of America,
120 Broadway, New York.

FIBRE (Vulcanized or Hard)
Spaulding Fibre Company, Inc.,
Tonawanda, N. Y.

FIRE BRICK AND CLAY
Ashland Fire Brick Co., Ashland, Ky.
Brighton Fire Brick Co.,
Block House Run, New Brighton, Pa.
Clearfield Brick Mfg. Co.,
Clearfield Trust Bldg., Clearfield, Pa.
Crescent Refractories Co.,
Curwensville, Clearfield Co., Pa.
Dover Fire Brick Co.,
Cuyahoga Bldg., Cleveland, Ohio.
General Refractories Co.,
117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown, Pa.
Inland Fire Brick Co., The,
1252 E. 55th St., Cleveland, O.
Inter-State Fire Clay Co.,
1273 Union Trust Bldg., Cleveland, O.
Ironton Fire Brick Co., The, Ironton, O.
Kier Fire Brick Co., Pittsburgh, Pa.
Laclede-Christy Clay Products Co.,
St. Louis, Mo.
Portsmouth Refractories Co., Portsmouth, O.
Pyro Clay Products Co., The, Oak Hill, O.
Queen's Run Refractories Co., Inc.,
Lock Haven, Pa.
Stowe-Fuller Refractories Co., The,
1650 Union Trust Bldg., Cleveland, O.
Superior Basic Brick Co.,
517 Bessemer Bldg., Pittsburgh, Pa.
Union Mining Co., Mt. Savage, Md.
United States Refractories Corp.,
Mt. Union, Pa.

FIRE CLAYS (Special Clays and Prepared Mixes)
Laclede-Christy Clay Products Co.,
St. Louis, Mo.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co., The,
818-868 Field Ave., Columbus, O.

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Dart, E. M., Mfg. Co., Providence, R. I.

FLANGING MACHINES
Dreis & Krump Mfg. Co.,
2917 S. Halstead St., Chicago, Ill.
Quickwork Co., The, St. Mary's, Ohio.

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American Foundry Equipment Co.,
366 Madison Ave., New York City
Diamond Clamp & Flask Co., Richmond, Ind.

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Irving Iron Works,
Long Island City, N. Y.

FLOORING (Steel, Ventilating, Nonslipping, Fireproof)
Irving Iron Works, Long Island City, N. Y.

FLOORING (Wood Block Creosoted)
Republic Creosoting Co.,
Merchants Bank Bldg., Indianapolis, Ind.

FLOOR PLATES (Rolled Steel)
American Pressed Steel Co.,
Commercial Trust Bldg., Philadelphia, Pa.

FLUOR SPAR
Hillside Fluor Spar Mines,
First National Bank Bldg., Chicago, Ill.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Rogers, Brown & Co., Cincinnati, O.

FLUX (Welding)
Oxweld Acetylene Co., Newark, N. J.

FORGES
Bradley, C. C., & Sons, Inc.,
432 N. Franklin St., Syracuse, N. Y.

FORGING BILLETS
Andrews Steel Co., Newport, Ky.
Central Steel Co., Massillon, O.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co.,
Philadelphia, Pa

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

CASTINGS

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Central Steel Co., Massillon, O.
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.

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Champan-Stein Furnace Co., Mt. Vernon, Ohio.

FORGING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Mackintosh-Hemphill Co., Pittsburgh, Pa.

FORGING (Brass)
Chicago Forging & Mfg. Co., 2004 Southport Ave., Chicago, Ill.

FORGING (Bronze and Copper)
Chicago Forging & Mfg. Co., 2004 Southport Ave., Chicago, Ill.

FORGINGS (Drop)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canton Forge & Axle Co., 2003-35 Deuber Ave., Canton, Ohio.
Columbus Forge & Iron Co., Columbus, O.
Drop Forging Co. of New York, Jersey City, N. J.
Eccles, Richard, Co., Auburn, N. Y.
Heppenstall Forge & Knife Co., Arsenal Station, Pittsburgh, Pa.
Ladish Drop Forge Co., Cudahy, Wis.
Oliver Iron & Steel Corp., So. 10th & Muriel Sts., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Pittsburgh Knife & Forge Co., Pittsburgh, Pa.
Pollak Steel Co., The, Cincinnati, O.
Queen City Forging Co., The, 235 Tennyson St., Cincinnati, Ohio.
Rockford Drop Forge Co., Rockford, Ill.
Scranton Forging Co., Scranton, Pa.
Storms Drop Forging Co., Page Blvd., Springfield, Mass.
Strieby & Foote Co., 301 Ogden St., Newark, N. J.
Transue & Williams Steel Forging Corp., Alliance, O.
Wheeling Axle Co., The, Wheeling, W. Va.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.

FORGINGS (Hollow Bored)
American Hollow Boring Co., 1055 West 19th St., Erie, Pa.

FORGINGS (Iron and Steel)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Canton Forge & Axle Co., 2003-35 Deuber Ave., Canton, Ohio.
Columbus Forge & Iron Co., Columbus, O.
Eccles, Richard, Co., Auburn, N. Y.
Heppenstall Forge & Knife Co., Pittsburgh, Pa.
Ladish Drop Forge Co., Cudahy, Wis.
Leard, Wm., Co., The, New Brighton, Pa.
McMyler-Interstate Co., Bedford, O.
Midvale Co., The, 4320 Wissahickon Ave., Philadelphia, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Pollak Steel Co., The, Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Storms Drop Forging Co., Page Blvd., Springfield, Mass.
Titusville Forge Co., Titusville, Pa.
Transue-Williams Steel Forging Corp., Alliance, O.
Vanadium Corp. of America, 120 Broadway, New York City.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.

FORMS (Steel for Concrete Construction)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.

FOUNDRY EQUIPMENT & SUPPLIES
American Foundry Equipment Co., Madison Ave. and 46th St., New York City.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.
Whiting Corporation, Harvey, Ill.

FOUNDRY PATTERN PLATES (Steel)
Moltrup Steel Products Co., Beaver Falls, Pa.

FOUNDRY SHOVELS
Wood Shovel & Tool Co., Piqua, Ohio.

FRAMES (Wire Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FUEL OIL BURNING SYSTEMS AND PLANTS
Fuller Engineering Co., Fullerton, Pa.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

FURNACE APPLIANCES (Water Cooled)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.

FURNACE INSULATION
Armstrong Cork & Insulation Co., 24th Street, Pittsburgh, Pa.
Celite Products Co., 53 W. Jackson Blvd., Chicago, Ill.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

FURNACE SYSTEMS (Open Hearth)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.

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Chapman-Stein Furnace Co., Mt. Vernon, Ohio.
Combustion Engineering Corp., 43 Broad St., New York City.
Electric Furnace Co., The, Salem, O.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Tate, Jones & Co., Inc., 914 Empire Bldg., Pittsburgh, Pa.

FURNACES (Blast)
Pennsylvania Engrg. Wks., New Castle, Pa.

FURNACES (Electric)
American Bridge Co., 71 Broadway, New York City.
Electric Furnace Co., The, Salem, O.
General Electric Co., Schenectady, N. Y.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Pittsburgh Electric Furnace Co., Union Bank Bldg., Pittsburgh, Pa.
Swindell, Wm., & Bros., P. O. Box 1753, Pittsburgh, Pa.

FURNACES (Open-Hearth)
Chapman-Stein Furnace Co., Mt. Vernon, Ohio.
Laughlin, Alex., & Co., First National Bank Bldg., Pittsburgh, Pa.
Smythe, S. R., Co., Pittsburgh, Pa.

FURNACES (Recuperative)
Combustion Engineering Corp., 43 Broad St., New York City.

FURNACES (Sherardizing)
New Haven Sherardizing Co., 688 Windsor St., Hartford, Conn.

GALVANIZING KETTLES AND POTS
National Wrought Iron Annealing Box Co., Washington, Pa.
Wilfong, Millard F., Iron Works Co., Philadelphia, Pa.

GALVANIZING PLANTS
Wilfong, Millard F., Iron Works Co., Philadelphia, Pa.

GALVANIZING PLANTS (For Sheets)
Erie Foundry Co., Erie, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

GANG SLITTERS
Ams, Max, Machine Co., The, 101 Park Ave., New York City.

GAS BOOSTERS (Rotary Positive Pressure)
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

GAS EXHAUSTERS
Chemical Engineering & Foundry Co., Atlanta, Ga.
Connersville Blower Co., The, Connersville, Ind.

GAS PRODUCER PLANTS
Chapman Engineering Co., Mt. Vernon, O.
Cooper, C. & G., Co., Mt. Vernon, O.
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
Flinn & Dreffein Co., 435 S. Dearborn St., Chicago, Ill.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Koppers Co., The, Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
Wellman-Seaver-Morgan Co., 7000 Central Ave., Cleveland, Ohio.
Wood, R. D., & Co., 400 Chestnut Ave., Philadelphia, Pa.

GAS RECOVERY COKE OVEN AND GAS PLANTS
Koppers Co., The, Pittsburgh, Pa.

GAS (Oxygen and Nitrogen)
Linde Air Products Co., 30 E. 42nd St., New York City.

GAS (Welding and Cutting)
Prest-O-Lite Co., Inc., The, Newark, N. J.

GAUGES (Welding)
Oxweld Acetylene Co., Newark, N. J.

GEAR BLANKS
Bethlehem Steel Co., Bethlehem, Pa.
Ladish Drop Forge Co., Cudahy, Wis.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

GEAR AND GEAR CUTTING
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

GEARS AND GEAR CUTTING (Iron & Steel)
American Adamite Co., The, 311 Oliver Bldg., Pittsburgh, Pa.
Connecticut Gears, Inc., Waterbury, Conn.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.
Horsburgh & Scott Co., 5114 Hamilton Ave., Cleveland, O.
Johnson, Carlyle, Machine Co., Manchester, Conn.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Ross-Meehan Foundries, Chattanooga, Tenn.
Simonds Mfg. Co., 25th St. & Liberty Ave., Pittsburgh, Pa.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

GEARS (Bakelite)
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

GEARS (Bevel-Generated Tooth)
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

GEARS (Herringbone)
Farrel Foundry & Machine Co., 344 Vulcan St., Buffalo, N. Y.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.

GEARS (Machine Molded)
Taylor-Wilson Manufacturing Co., McKees Rocks, Pa.

GEARS (Miter, Ring, Spiral, Worm)
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

GEARS (Rawhide)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.
Horsburgh & Scott Co., 5114 Hamilton Ave., Cleveland, O.

GEARS (Reverse Marine)
General Electric Co., Schenectady, N. Y.
Johnson, Carlyle, Machine Co., Manchester, Conn.

GENERATING SETS
Crocker-Wheeler Co., Ampere, N. J.
General Electric Co., Schenectady, N. Y.

GENERATORS (Direct and Alternate Current)
Castle & Wilson, 1601 Arnott Bldg., Pittsburgh, Pa.
Crocker-Wheeler Co., Ampere, N. J.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

GLASS CLEANERS (Liquid and Powder)
Skybryte Co., The, Keith Bldg., Cleveland, Ohio.

GLOVES (Asbestos)
Oxweld Acetylene Co., Newark, N. J.

GLOVES (Steel Grip)
Industrial Gloves Corp., 1213 Fullerton Ave., Chicago, Ill.

GRATING (Flooring, Subway, Step and Other Purposes)
Irving Iron Works, Long Island City, N. Y.

GRATING-STEEL (Subway, Area, Sidewalk, Ventilation)
Irving Iron Works, Long Island City, N. Y.

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Landis Tool Co., Waynesboro, Pa.

GRINDERS (Electric-Pneumatic-Portable)
Chicago Pneumatic Tool Co., 6 East 44th St., New York City.
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

GRINDERS (Roll)
Landis Tool Co., Waynesboro, Pa.

GRINDING MACHINES
Landis Tool Co., Waynesboro, Pa.

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Cleveland Pneumatic Tool Co.,
3734 E. 78th St. Cleveland, O.
Ingersoll-Rand Co., 11 Broadway,
New York City.

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Bliss, E. W., Co.,
53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co.,
Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Long & Allstatter Co., Hamilton, Ohio.
Moloch Co., The, Kaukauna, Wis.
Morgan Engineering Co., The, Alliance, Ohio.
Toledo Machine & Tool Co., Toledo, O.

HAMMERS (Power)
Bradley, C. C., & Son, Inc., Syracuse, N. Y.
Cleveland Punch & Shear Works,
Cleveland, O.
Erie Foundry Co., Erie, Pa.
Moloch Co., The, Kaukauna, Wis.
Yoder Co., The,
5510 Walworth St., Cleveland, O.

HAMMERS (Rawhide)
Chicago Rawhide Mfg. Co.,
1305 Elston Ave., Chicago, Ill.

HAMMERS (Steam)
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co., The, Alliance, O.

HANGERS (Door)
Myers, F. E., & Brother Co., The,
Ashland, Ohio

HANGERS (Shaft)
Hyatt Roller Bearing Co., Newark, N. J.
Jones, W. A., Foundry & Machine Co.,
4437 West Roosevelt Rd., Chicago, Ill.

HARDWARE
Chicago Forging & Mfg. Co.,
2004 Southport Ave., Chicago, Ill.

HEATERS (Feed Water)
Harrisburg Pipe & Pipe Bending Co.,
Harrisburg, Pa.

HOISTING MACHINERY
Brown Hoisting Machinery Co.,
4403 St. Clair Ave., Cleveland, Ohio.
Cleveland Crane & Engrg. Co., Wickliffe, O.
Illinois Malleable Iron Co.,
180 Diversey Blvd., Chicago, Ill.
McMyler-Interstate Co., Bedford, O.
Orton & Steinbrenner Co.,
608 Dearborn St., Chicago, Ill.
Shepard Electric Crane & Hoist Co.,
358 Schuyler Ave., Montour Falls, N. Y.
Treadwell Engineering Co., Easton, Pa.

HOISTS (Electric)
Box, Alfred, Co.,
Janney & E. Ontario St., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Link-Belt Co., Chicago, Ill.
Milwaukee Electric Crane & Mfg. Co.,
Milwaukee, Wis.
Northern Engineering Works,
218 Chene St., Detroit, Mich.
Pawling & Harnischfeger Co.,
Milwaukee, Wis.
Shepard Electric Crane & Hoist Co.,
358 Schuyler Ave., Montour Falls, N. Y.

HOISTS (Pneumatic)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.
Hanna Engineering Works,
1765 Elston Ave., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway,
New York City.
Whiting Corp., Harvey, Ill.

HOLDERS (Tool)—See TOOL HOLDERS

HOOPS AND BANDS
Acme Steel Goods Co.,
2840 Archer Ave., Chicago, Ill.
Bourne-Fuller Co.,
Hanna Bldg., Cleveland, O.
Morris, Wheeler & Co.,
30th and Locust Sts., Philadelphia, Pa.
Ryerson, Joseph T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
West Leechburg Steel Co., Pittsburgh, Pa.

HOOPS AND BANDS (Strips)
Sharon Steel Hoop Co., Sharon, Pa.

HOOPS, BANDS AND SHAPES (Galvanized)
McCalla, Harold, Co., The,
Beach St. and E. Columbia Ave.,
Philadelphia, Pa.

HOSE (Pneumatic)
Chicago Pneumatic Tool Co.,
6 East 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway,
New York City.

HOSE (Welding)
Oxweld Acetylene Co., Newark, N. J.

HOT BEDS
McKee, Willis, 2422 Euclid Ave.,
Cleveland, O.
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

HOT BLAST STOVES
Riter-Conley Co.,
Oliver Bldg., Pittsburgh, Pa.

HYDRAULIC MACHINERY
Allis Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Chambersburg Engineering Co.,
Chambersburg, Pa.
Morgan Engineering Co., The, Alliance, O.
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

HYDRAULIC PRESSES—See PRESSES (Hydraulic)

INDUSTRIAL HAULAGE EQUIPMENT
General Electric Co., Schenectady, N. Y.

INGOT MOLDS
American Adamite Co., The,
311 Oliver Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Fdy. & Mach. Co.,
Birdsboro, Pa.
Penn Mold & Mfg. Co., Wheeling, W. Va.
Valley Mould & Iron Corp.,
Sharpsville, Pa.

INSTRUMENTS (Electric Indicating and Recording)
General Electric Co., Schenectady, N. Y.

INSULATING BRICK
Armstrong Cork & Insulation Co.,
24th St., Pittsburgh, Pa.
Celite Products Co.,
53 W. Jackson Blvd., Chicago, Ill.
Quigley Furnace Specialties Co.,
26 Cortlandt St., New York City.

INSULATION (Furnaces, Boiler Settings Ovens, Steam Pipe, Etc.)
Armstrong Cork & Insulation Co.,
24th St., Pittsburgh, Pa.
Celite Products Co.,
53 W. Jackson Blvd., Chicago, Ill.
Quigley Furnace Specialties Co.,
26 Cortlandt St., New York City.

IRON
Interstate Iron & Steel Co.,
104 So. Michigan Ave., Chicago, Ill.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.

IRON (Bar)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., Hanna Bldg.,
Cleveland, O.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON (Chain)
Bethlehem Steel Co., Bethlehem, Pa.

IRON (Engine Bolt)
Bethlehem Steel Co., Bethlehem, Pa.

IRON (Silver)
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.

IRON (Staybolt)
Bethlehem Steel Co., Bethlehem, Pa.

IRON ORE
Agnew, Batteiger & Co.,
1642 Widener Bldg., Philadelphia, Pa.
Cleveland-Cliffs Iron Co., Cleveland, O.
Hanna, The M. A., Co., Cleveland, O.
Hillman Coal & Coke Co.,
First Nat'l Bank Bldg., Pittsburgh, Pa.
Marquette Ore Co.,
Rockefeller Bldg., Cleveland, O.
Park & Williams, Inc.,
Rea Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co.,
Union Trust Bldg., Cleveland, O.
Quinn, Clement K., & Co., Duluth, Minn.
Savage, John A., & Co., Duluth, Minn.
Snyder, W. P., & Co., Oliver Bldg.,
Pittsburgh, Pa.
Tod-Stambaugh Co.,
Hanna Bldg., Cleveland, O.

IRON AND STEEL (Swedish)
Ljusne-Woxna. Aktiebolag, Ljusne, Sweden.

JIGS AND FIXTURES
Moloch Co., The, Kaukauna, Wis.

JOISTS AND STUDS (Pressed Steel)
Central Steel Co., Massillon, Ohio.
Truscon Steel Co.,
615 Wayne St., Detroit, Mich.

KETTLES (Galvanizing)—See GALVANIZING KETTLES AND POTS

KEYS AND COTTERS (Machine)
Leard, Wm., Co., The, New Brighton, Pa.
Moltrup Steel Products Co.,
Beaver Falls, Pa.
Morton Mfg. Co., Muskegon Heigths, Mich.
Standard Gauge Steel Co., Beaver Falls, Pa.

KEYSEATING MACHINES
Morton Mfg. Co., Muskegon Heights, Mich.
Pawtucket Mfg. Co.,
327 Pine St., Pawtucket, R. I.

KNIVES AND SHEAR BLADES—See SHEAR BLADES AND KNIVES

LADLES
Pennsylvania Engrg. Works, New Castle, Pa.
Riter-Conley Co., Oliver Bldg.,
Pittsburgh, Pa.
Whiting Corp., Harvey, Ill.

LADLES (Sleeves and Nozzles)
Laclede-Christy Clay Products Co.,
St. Louis, Mo.

LAKE PASSENGER & FREIGHT
Cleveland & Buffalo Transit Co.,
E. 9th St., Cleveland, Ohio.

LATH (Expanded Metal)
Central Steel Co., Massillon, Ohio.
Truscon Steel Co.,
615 Wayne St., Detroit, Mich.

LATHES
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.

LATHES (Roll Turning)
Lewis Foundry & Machine Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Standard Engineering Co., Ellwood City, Pa.
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

LEAD BURNING APPARATUS (Oxy-Acetylene)
Oxweld Acetylene Co., Newark, N. J.

LEADER PINS AND BUSHINGS
Danly Machine Specialties, Inc.,
4915 Lincoln Ave., Chicago, Ill.

LEATHER BELTING—See BELTING (Leather)

LETTERHEADS (Engraved)
Wiggins, John B., Co.,
705 Peoples Gas Bldg., Chicago, Ill.

LEVELING MACHINES
United Engineering & Foundry Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

LIFTING MAGNETS
Cutler-Hammer Mfg. Co., The,
Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.
Ohio Electric & Controller Co.,
5900 Maurice Ave., Cleveland, O.

LOCOMOTIVE CRANES—See CRANES (Locomotive)

LOCOMOTIVES
Porter, H. K., Co.,
Union Bank Bldg., Pittsburgh, Pa.

LOCOMOTIVES (Electric)
Atlas Car & Mfg. Co., 1100 Ivanhoe Rd.,
Cleveland, O.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVES (Storage Battery)
Atlas Car & Mfg. Co., 1100 Ivanhoe Rd.,
Cleveland, O.

MACHINE KEYS—See KEYS AND COTTER (Machine)

MACHINE TENDERS & TOOL STANDS (Steel)
Angle Steel Stool Co., Plainwell, Mich.

MACHINE WORK
Adamson Machine Co., The, Akron, O.
Air Tight Steel Tank Co.,
Mansion & Gloster Sts., Pittsburgh, Pa.
Bettcher Stamping & Mfg. Co.,
3106 W. 61st St., Cleveland, O.
Bliss, E. W., Co.,
53rd St. and 2nd Ave., Brooklyn, N. Y.
Gray, Peter, & Sons Co., Cambridge, Mass.
Johnson, Carlyle, Machine Co.,
Manchester, Conn.
Lammert & Mann Co.,
Wood and Walnut Sts., Chicago, Ill.
Moloch Co., The, Kaukauna, Wis.
Smith Gas Engineering Co., Dayton, O.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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Arcade Detachable Chain
Arcade Malleable Iron Co.
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MACHINERY (Used)
Carbon Steel Co., Pittsburgh, Pa.
Castle & Wilson,
1601 Arnott Bldg., Pittsburgh, Pa.
Consolidated Products Co., Inc.,
15 Park Row, New York City.
Davis, Fraser,
Seventh Ave. Hotel, Pittsburgh, Pa.
Essley, E. L., Machinery Co., The,
551-557 W. Washington Blvd., Chicago, Ill.
Goodman, M. D.,
185 Bigelow St., Newark, N. J.
Marr-Galbreath Machinery Co.,
127-129 Water St., Pittsburgh, Pa.
McCoy-Brandt Machinery Co.,
210-14 Penn Ave., Pittsburgh, Pa.
Miles Machinery Co., Saginaw, Mich.
Morey & Co., Inc.,
410 Broome St., New York City.
Nashville Industrial Corp.,
Old Hickory, Tenn.
Niles, F. H., & Co., Inc.,
Claremont and West Side Aves.,
Jersey City, N. J.
Potts, Henry, & Co.,
1608 Bankers Trust Bldg., Philadelphia, Pa.
Riverside Machinery Depot,
251 St. Aubin Ave., Detroit, Mich.
Russell Machine Co., Pittsburgh, Pa.
Scully-Jones & Co.,
2012 W. 13th St., Chicago, Ill.
Simmons Machine Tool Corp., Albany, N. Y.
Vonnegut Machinery Co.,
25 W. South St., Indianapolis, Ind.
Wickes Machinery Co.,
Claremont and West Side Aves.,
Jersey City, N. J.

MAGNESITE
Harbison-Walker Refractories Co.,
Farmers Bank Bldg., Pittsburgh, Pa.

MAGNETS (Lifting)—See LIFTING MAGNETS

MANGANESE METALS
Browne, DeCourcy, Inc.,
8 West 40th St., New York City.
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.

MATERIAL HANDLING MACHINERY
Browning Co., The,
E. 162nd St. & Waterloo Rd., Cleveland, O.
Link-Belt Co.,
910 S. Michigan Ave., Chicago, Ill.
McMyler-Interstate Co., Bedford, O.

MERCHANT MILL EQUIPMENT
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

METAL CLEANER
Ford, J. B., Co., The, Wyandotte, Mich.

METAL SPECIALTIES AND PARTS
Erdle Perforating Co., 171 York St.,
Rochester, N. Y.

METAL (Perforated)
Erdle Perforating Co.,
171 York St., Rochester, N. Y.

METALS (Nonferrous)
Titanium Alloy Mfg. Co.,
Niagara Falls, N. Y.

METAL SPECIALTIES AND PARTS
Erdle Perforating Co.,
171 York St., Rochester, N. Y.

METAL STAMPINGS—See STAMPINGS

METAL WORKING MACHINES — SEE SHEET METAL WORKING MACHINERY

METERS (Gas and Air)
Connersville Blower Co., The,
Connersville, Ind.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

MILLING MACHINES
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.

MILLS (Blooming, Universal Plate, Sheet, Etc.)
Lewis Foundry & Machine Co.,
Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Treadwell Engineering Co., Easton, Pa.

MINING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

MINING SHOVELS
Wood Shovel & Tool Co., Piqua, Ohio.

MIXERS (Sand)
National Engineering Co.,
549 W. Washington Blvd., Chicago, Ill.

MIXING, KNEADING, TEMPERING AND PUGGING MACHINERY
National Engineering Co.,
549 W. Washington Blvd., Chicago, Ill.

MOLDS (Ingot)—See INGOT MOLDS

MOLDING MACHINES
American Foundry Equipment Co.,
366 Madison Ave., New York City.
Beardsley & Piper Co.,
2541 N. Keeler Ave., Chicago, Ill.
Hanna Engineering Works,
1765 Elston Ave., Chicago, Ill.
Herman Pneumatic Machine Co.,
806 Union Bank Bldg., Pittsburgh, Pa.

MOLDING MACHINES (Tractor Type Sand Throwing)
Beardsley & Piper Co.,
2541 N. Keeler Ave., Chicago, Ill.

MONEL METAL
Driver-Harris Co., Harrison, N. J.
International Nickel Co.,
67 Wall St., New York City.

MOTORS (Electric)
Crocker-Wheeler Co., Ampere, N. J.
Electric Controller & Mfg. Co.,
2700 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

MUCK BAR
Bethlehem Steel Co., Bethlehem, Pa.

NAILS
American Steel & Wire Co.,
208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Corp.,
Balfour Bldg., San Francisco, Cal.
Pittsburgh Steel Co.,
P. O. Box 72, Pittsburgh, Pa.
Youngstown Sheet & Tube Co.,
Youngstown, O.

NAILS (Coated and Galvanized)
American Steel Co., Park Bldg.,
Pittsburgh, Pa.

NICKEL
American Nickel Corp., Clearfield, Pa.
International Nickel Co.,
67 Wall St., New York City.
United States Nickel Co.,
New Brunswick, N. J.

NICKEL STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

NITROGEN (Gas)
Air Reduction Sales Co.,
342 Madison Ave., New York City.
Linde Air Products Co., 30 E. 42nd St.,
New York City.

NUTS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The,
Hanna Bldg., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Lake Erie Bolt & Nut Co.,
915 E. 63rd St., Cleveland, Ohio.
Maryland Bolt & Nut Co., The,
Mt. Washington, Baltimore, Md.
Milton Mfg. Co., The, Milton, Pa.
National Acme Co., The,
7500 Stanton Ave., Cleveland, O.
Oliver Iron & Steel Corp.,
So. 10th & Murial Sts., Pittsburgh, Pa.
Rockford Bolt Co.,
220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co.,
Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
Wickman Screw Works,
420 Neptune Ave., Pittsburgh, Pa.

OIL (Fuel)—See FUEL OIL

OILS (Rustproofing)
Thompson & Co.,
857 W. North Ave., Pittsburgh, Pa.

OPEN-HEARTH FURNACES — See FURNACES (Open Hearth)

OVENS (Coke By-Product Recovery)
Koppers Co., The, Pittsburgh, Pa.

OVENS (Core)
Maehler, Paul, Co.,
2206 W. Lake St., Chicago, Ill.

OVENS (Enameling and Japanning)
Cullen-Atkinson Co., Inc., The,
120 Allyn St., Hartford, Conn.
Maehler, Paul, Co.,
2206 W. Lake St., Chicago, Ill.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

OXYGEN AND HYDROGEN
International Oxygen Co., Newark, N. J.

OXYGEN IN CYLINDERS
Air Reduction Sales Co.,
342 Madison Ave., New York City.

OXYGEN (Gas)
Linde Air Products Co.
30 E. 42nd St., New York City.

PACKING (Leather)
Chicago Rawhide Mfg. Co.,
1305 Elston Ave., Chicago, Ill.

PAINTS (Industrial)
Thompson & Co.,
857 W. North St., Pittsburgh, Pa.

PATTERN PLATES (Steel)
Moltrup Steel Products Co., Beaver Falls, Pa.

PERFORATED METAL
Chicago Perforating Co.,
2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co.,
171 York St., Rochester, N. Y.

PICKLING TANKS
Hauser-Stander Tank Co., The,
Cincinnati, O.

PICKS, MATTOCKS, ETC.
Oliver Iron & Steel Corp.,
So. 10th & Muriel Sts., Pittsburgh, Pa.

PIG IRON
Addy, The Matthew, Co., Cincinnati, O.
Adrian Furnace Co., Du Bois, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland-Cliffs Iron Co., Cleveland, O.
Crocker Brothers,
21 E. 40th St., New York City.
Delaware River Steel Co., Chester, Pa.
Donner Steel Co., Inc.,
P. O. Box 1000, Buffalo, N. Y.
Eaton, Rhodes & Co., Cincinnati, Ohio.
Globe Iron Co., Jackson, O.
Hanna, The M. A., Co., Cleveland, O.
Illinois Steel Co., 208 So. La Salle St.,
Chicago, Ill.
Lavino, E. J., & Co.,
Bullitt Bldg., Philadelphia, Pa.
Ljusne-Woxna Aktiebolag, Ljusne, Sweden.
Mohr, J. J., & Son,
Bullitt Bldg., Philadelphia, Pa.
Park & Williams, Inc.,
Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co.,
Union Trust Bldg., Cleveland, O.
Pilling & Company,
1315 Walnut St., Philadelphia, Pa.
Rogers, Brown & Co., Cincinnati, Ohio.
Runyon, W. C., & Co.,
350 Madison Ave., New York City.
Savage, John A., & Co., Duluth, Minn.
Snyder, W. P., & Co., Oliver Bldg.,
Pittsburgh, Pa.
Stewart Furnace Co.,
1854 Union Trust Bldg., Cleveland, O.
Valley Mould & Iron Corp., Sharpsville, Pa.
Wheeliing Steel Corp., Wheeling, W. Va.
Wickwire-Spencer Steel Corp.,
41 E. 42nd St., New York City.
Wood, Alan, Iron & Steel Co.,
Philadelphia, Pa.

PIG IRON (Charcoal)
Rogers, Brown & Co., Cincinnati, Ohio.

PILE DRIVERS
Browning Co., The,
E. 162nd St. & Waterloo Rd., Cleveland.
McMyler-Interstate Co., Bedford, O.
Orton & Steinbrenner Co.,
608 S. Dearborn St., Chicago, Ill.

PILING (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

PINIONS—See GEARS AND GEAR CUTTING

PINS
Champion Rivet Co.,
E. 108th St. and Harvard Ave.,
Cleveland, O.

PIPE (Riveted Steel)
Abendroth & Root Mfg. Co.,
Woolworth Bldg., New York City.
Petroleum Iron Works Co. of Ohio,
Sharon, Pa.

PIPE (Spiral Riveted)
Abendroth & Root Mfg. Co.,
New York City.

PIPE (Standard)
Wheeling Steel Corp., Wheeling W. Va.

PIPE (Steel)
Central Tube Co.,
First National Bank Bldg., Pittsburgh, Pa.
Crane Co., The,
836 S. Michigan Ave., Chicago, Ill.
Jones & Laughlin Steel Corp.,
Pittsburgh, Pa.
National Tube Co., Frick Bldg.,
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Youngstown Sheet & Tube Co.,
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PIPE (Wrought Steel)
Central Tube Co., First National Bank Bldg., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PIPE BENDS
Crane Co., The, 836 S. Michigan Ave., Chicago, Ill.
Pittsburgh Piping & Equipment Co., 35th & Charlotte Sts., Pittsburgh, Pa.

PIPE CUTTING AND THREADING MACHINERY
Standard Engrg. Co., Ellwood City, Pa.

PIPE FITTINGS
Chemical Engineering & Foundry Co., Atlanta, Ga.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Jenkins Bros., 80 White St., New York City.
Pittsburgh Piping & Equip. Co., 35th & Charlotte Sts., Pittsburgh, Pa.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PIPE MILL MACHINERY
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE STRAIGHTENING MACHINES
Logemann Brothers Co., 3120 Burleigh St., Milwaukee, Wis.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE WRENCHES — See WRENCHES (Pipe)

PIPING CONTRACTORS
Floersheim, B., & Co., 622 Farmers Bank Bldg., Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., 35th & Charlotte Sts., Pittsburgh, Pa.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PLANERS AND SHAPERS
Cleveland Punch & Shear Works, Cleveland, O.
Morton Mfg. Co., Muskegon Heights, Mich.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

PLATE CASTORS
Hyatt Roller Bearing Co., Newark, N. J.

PLATES (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

PLATES (Rolled Steel—Floor)
Wood, Alan, Iron & Steel Co. Philadelphia, Pa.

PLATES (Sheared and Universal)
Allegheny Steel Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, Hanna Bldg., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Lukens Steel Co., Coatesville, Pa.
Morris & Bailey Steel Division, Oliver Iron & Steel Corp., Wilson Station, Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Newport Rolling Mill Co., Newport, Ky.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co., Philadelphia, Pa.
Worth Steel Co., Claymont, Del.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES (Steel)
Otis Steel Co., The, Leader-News Bldg., Cleveland, O.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES — (Terne and Tin)— See TIN PLATE

PLUMBING EQUIPMENT
Crane Co., The, 836 S. Michigan Ave. Chicago, Ill.

PNEUMATIC DIE CUSHIONS
Marquette Tool & Mfg. Co., 321 W. Ohio St., Chicago, Ill.

PNEUMATIC TOOLS—See TOOLS (Pneumatic)

POLES (Tubular Steel)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PORTABLE LOADERS (Bucket or Belt)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

POTS (Galvanizing and Tinning)—See GALVANIZING KETTLES AND POTS

POWDERED COAL EQUIPMENT
Combustion Engineering Corp., 43 Broad St., New York City.
Fuller Engineering Co., Fullerton, Pa.
Grindle Fuel Equipment Co., Harvey, Ill.

POWER TRANSMISSION
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

POWER TRANSMISSION (Chain and Sprocket)
Baldwin Chain & Mfg. Co., Worcester, Mass.

PRESSED METAL—See STAMPINGS

PRESSED STEEL PARTS—See STAMPINGS

PRESSES
Ams, Max, Machine Co., 101 Park Ave., New York City.
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch and Shear Works, Cleveland, Ohio.
Erie Foundry Co., Erie, Pa.
Logemann Bros. Co., 3120 Burleigh St., Milwaukee, Wis.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Moloch Co., The, Kaukauna, Wis.
Toledo Machine & Tool Co., Toledo, O.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PRESSES (Die Cutting)
Logemann Bros. Co., 3120 Burleigh St., Milwaukee, Wis.

PRESSES (Forging)
Morgan Engineering Co., The, Alliance, Ohio.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

PRESSES (Hydraulic)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Morgan Engineering Co., The, Alliance, Ohio.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PRESSES (Metal Drawing, Etc.)
Ams, Max, Machine Co., The, 101 Park Ave., New York City.
Bliss, E. W., Company, 53rd St. and 2nd Ave., Brooklyn, N. Y.

PRESSES (Roofing & Corrugating)
Streine Tool & Mfg. Co., The, New Bremen, Ohio.

PRESSES (Scrap Bundling and Baling)
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

PRESSES (Shaft and Pipe Straightening—Hydraulic)
Logemann Bros. Co., 3120 Burleigh St., Milwaukee, Wis.

PRESSES (Straightening)
Chambersburg Engineering Co., Chambersburg, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

PRODUCER GAS SYSTEMS (See GAS PRODUCER PLANTS)

PULLEYS (Magnetic)
Magnetic Mfg. Co., 278 Twenty-fourth Ave., Milwaukee, Wis.

PUMPS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connersville Blower Co., The, Connersville, Ind.

PUMPS (Boiler Feed)
Ingersoll-Rand Co., 11 Broadway, New York.

PUMPS (Centrifugal)
Ingersoll-Rand Co., 11 Broadway, New York.
Kane & Roach, Niagara and Shonnard Sts., Syracuse, N. Y.

PUMPS (Hand & Power)
Myers, F. E., & Brother Co., The, Ashland, Ohio.

PUMPS (Hydraulic)
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

PUNCHES (Multiple)
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

PUNCHES AND DIES
Cleveland Steel Tool Corp., The, 660 East 82nd St., Cleveland, O.
Marchant, George F., Co., 1434 Rockwell St., Chicago, Ill.
Richards, I. P., Co., Providence, R. I.

PUNCHING AND SHEARING MACHINERY
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Cleveland Punch & Shear Works, Cleveland, O.
Long & Allstatter Co., Hamilton, O.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

RACKS (Machine)
Ganschow, Wm., Co., 42 N. Morgan St., Chicago, Ill.
Standard Gauge Steel Co., Beaver Falls, Pa.

RAILS
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Foster, L. B., Co., Pittsburgh, Pa.
Frank, M. K., Union Trust Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

RAILS (Girder)
Bethlehem Steel Co., Bethlehem, Pa.

REAMERS
Cleveland Twist Drill Co., The, Lakeside Ave. and E. 49th St., Cleveland, Ohio.

REDUCERS (Speed—Worm and Spur)
Ganschow, Wm., Co., 42 N. Morgan St., Chicago, Ill.

REFRACTORIES
Ashland Fire Brick Co., Ashland, Ky.
Bour, L. J., Refractories Co., Inc., The, Scranton, Pa.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Crescent Refractories Co., Curwensville, Pa.
Dover Fire Brick Co., 830 Cuyahoga Bldg., Cleveland, O.
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
Harbison -Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Ironton Fire Brick Co., The, Ironton, O.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Soisson, Joseph, Fire Brick Co., Connellsville, Pa.
Stowe-Fuller Refractories Co., The, 1650 Union Trust Bldg., Cleveland, O.
Superior Basic Brick Co., 517 Bessemer Bldg., Pittsburgh, Pa.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
United States Refractories Corp., Mt. Union, Pa.

REGULATORS (Compressed Gas)
Oxweld Acetylene Co., Newark, N. J.

REINFORCEMENTS (Steel)
Truscon Steel Co., 615 Wayne St., Detroit, Mich.

RESISTANCE MATERIAL
Driver-Harris Co., Harrison, N. J.

RHEOSTATS
Electric Controller & Mfg. Co., Cleveland, O.

RINGS (Mud for Upright Boilers)
Akron-Selle Co., Akron, O.

RINGS (Welded Iron & Steel)
Akron-Selle Co., Akron, O.

RIVETERS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.

RIVETING MACHINERY
Hanna Engineering Works, 1765 Elston Ave, Chicago, Ill.
Shuster, The F. B., Co., New Haven, Conn.

RIVET HEATERS (Electric)
American Car & Foundry Co., 165 Broadway, New York City.
General Electric Co., Schenectady, N. Y.

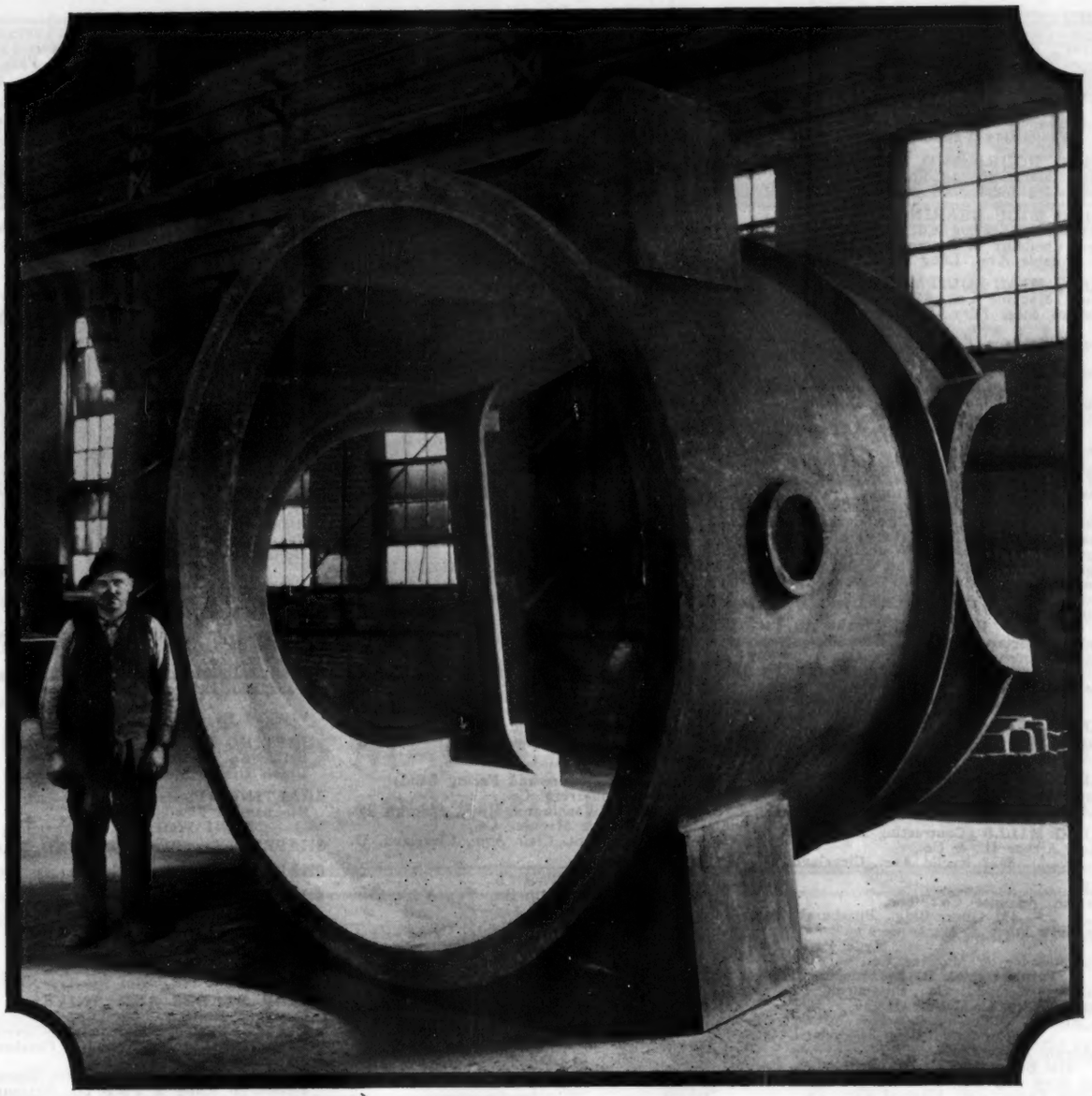
RIVET SETS
Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, O.
Hunter Saw & Machine Co., 57th and Butler Sts., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell, Chicago, Ill.

RIVETS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Company, Hanna Bldg., Cleveland, O.
Champion Rivet Co., E. 108th St. and Harvard Ave., Cleveland, O.
Illinois Steel Warehouse Co., Chicago, Ill.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

RODS (Drill)
Kidd Drawn Steel Co., Aliquippa, Pa.
National Drawn Steel Co., E. Liverpool, O.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.

RODS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

RODS (Welding)—See WELDING RODS



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Treadwell Engineering Co., Easton, Pa.
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Norma Company of America, Anable Ave., Long Island City, N. Y.

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Alliance Machine Co., Alliance, Ohio.
Birdsboro Steel Fdry. & Machine Co., Birdsboro, Pa.
Blake & Johnson Co., The, 185 N. Elm St., Waterbury, Conn.
Farrel Foundry & Machine Co. 344 Vulcan St., Buffalo, N. Y.
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Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Kane & Roach, Niagara and Shonnard Sts., Syracuse, N. Y.
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Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., West Homestead, Pa.
Morgan Construction Co., Worcester, Mass.
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Standard Engineering Co., Ellwood City, Pa.
Sutton-Abramsen Engrg. Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

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Treadwell Engineering Co., Easton, Pa.

ROLLING MILLS (Contracting Engineers)
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Hyde Park Fdry. & Mach. Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., West Homestead, Pa.
Otis Steel Co., The, Leader-News Bldg., Cleveland, O.
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.
Pollak Steel Co., The, Cincinnati, Ohio.
Standard Engrg. Co., Ellwood City, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

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ROLLS (Hardened Steel)
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Midvale Co., The, 4320 Wissahickon Ave., Philadelphia, Pa.
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

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Hubbard Steel Foundry Co., East Chicago, Ind.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

ROLLS (Special)
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.

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American Sheet & Tin Plate Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Newport Rolling Mill Co., Newport, Ky.

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National Tube Co., Frick Bldg., Pittsburgh, Pa.

SAFETY DEVICES (Electric)
Electric Controller & Mfg. Co., Cleveland, O.

SAFETY STEPS AND TREADS
Irving Iron Works, Long Island, N. Y.

SAND
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United States Silica Co., 122 South Michigan Ave., Chicago, Ill.

SAND (Molding)
Rogers, Brown & Co., Cincinnati, O.

SAND (Sand Blast)
Portage Silica Co., The, 602 Stambaugh Bldg., Youngstown, O.
United States Silica Co., 122 South Michigan Ave., Chicago, Ill.

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Globe Steel Abrasive Co., The, Mansfield, Ohio.
Pittsburgh Crushed Steel Co., 61st & A. V. R. R., Pittsburgh, Pa.

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Koven, L. O., & Brother, Inc., 152 Ogden St., Jersey City, N. J.
Pangborn Corporation, P. O. Box 858, Hagerstown, Md.

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Link-Belt Co., Chicago, Ill.
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Standard Sand & Machine Co., Cleveland, O.
Whiting Corp., Harvey, Ill.

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Standard Sand & Machine Co., 5151 St. Clair Ave., Cleveland, O.

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Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.

SAND SLINGERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

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Skybryte Co., The, Keith Bldg., Cleveland, O.

SASH (Steel Casement)
Truscon Steel Co., 615 Wayne St., Detroit, Mich.

SAW SHARPENING MACHINES
Hunter Saw & Machine Co., 57th and Butler Sts., Pittsburgh, Pa.

SAWS (Cold and Hot Metal)
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Mackintosh-Hemphill Co., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Agnew, Batteiger & Co., 1642 Widener Bldg., Philadelphia, Pa.

SCRAP BALING PRESSES
Logemann Bros. Co., 3120 Burleigh Ave., Milwaukee, Wis.

SCRAP BUNDLING MACHINES (Wire Mills)
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Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.

SCREENS AND SIEVES
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Hendrick Mfg. Co., The, Carbondale, Pa.

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Cleveland Twist Drill Co., The, Lakeside Ave. and E. 49th St., Cleveland, Ohio.

SCREW MACHINES (Automatic)
National Acme Co., 7500 Stanton Ave., Cleveland, O.

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Milford Mfg. Co., The, 33 Buckingham Ave., Milford, Conn.
National Acme Co., 7500 Stanton Ave., Cleveland, O.
Park Mfg. Co., Worcester, Mass.
Scovill Mfg. Co., Waterbury, Conn.

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Lancaster Steel Products Corp., Lancaster, Pa.
Moltrup Steel Products Co., Beaver Falls, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

SCREW STOCK (Free Cutting)
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

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Clark Bros. Bolt Co., Milldale, Conn.
Progressive Mfg. Co., Torrington, Conn.

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National Acme Co., The, 7500 Stanton Ave., Cleveland, O.
Scovill Mfg. Co., Waterbury, Conn.

SEAMERS (Automatic, Double)
Ams, Max, Machine Co., 101 Park Ave., New York City.

SEAMLESS STEEL TUBING—See TUBES (Cold Drawn Seamless Steel)

SEPARATORS (Magnetic)
Magnetic Mfg. Co., 278 Twenty-fourth Ave., Milwaukee, Wis.

SHAFT AND PIPE STRAIGHTENERS (Hydraulic)
Logemann Brothers Co., 3120 Burleigh Ave., Milwaukee, Wis.

SHAFT HANGERS
Hyatt Roller Bearing Co., Newark, N. J.

SHAFTING
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Bliss & Laughlin, Inc., Harvey, Ill.
Moltrup Steel Products Co., Beaver Falls, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pollak Steel Co., The, Cincinnati, Ohio.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Corp. of America, 120 Broadway, New York City.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAFTING (Cold Drawn and Turned)
Bethlehem Steel Co., Bethlehem, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

SHAFTING (Flexible)
Binghamton Flexible Shaft Co., 239-41 Water St., Binghamton, N. Y.

SHAPERS—See PLANERS AND SHAPERS

SHAPES—See STEEL (Structural)

SHAPES (Round, Square, Hexagon)
Union Drawn Steel Co., Beaver Falls, Pa.

SHAPES (Special)
Sharon Steel Hoop Co., Sharon, Pa.
Walsh & McGee Steel Co., 2 Rector St., New York City.

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Cleveland Knife & Forge Co., 1960 West 114th St., Cleveland, O
Heppenstall Forge & Knife Co., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell, Chicago, Ill.
Pittsburgh Knife & Forge Co., Pittsburgh, Pa.

SHEARS
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Erie Foundry Co., Erie, Pa.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Morgan Engineering Co., The, Alliance, Ohio.
National Roll & Foundry Co., Avonmore, Pa.
Quickwork Co., The, St. Marys, Ohio.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Toledo Machine & Tool Co., Toledo, O.
United Engrg. & Fdry. Co., Farmers Bank Bldg., Pittsburgh, Pa.
Yoder Co., The, 5510 Walworth St., Cleveland, O.

SHEARS (Beveling)
Quickwork, Co., The, St. Marys, Ohio.

SHEARS (Circular, Plate, Rotary, Serpentine)
Quickwork Co., The, St. Marys, Ohio.

SHEARS (Doubling & Squaring)
Streine Tool & Mfg. Co., The, New Bremen, Ohio.

SHEARS (Metal Slitting)
Streine Tool & Mfg. Co., The, New Bremen, Ohio.

SHEARS (Plate)
Streine Tool & Mfg. Co., The, New Bremen, Ohio

SHEARS (Straight Slitting)
Quickwork Co., The, St. Marys, Ohio.

SHEET BARS
Andrews Steel Co., Newport, Ky.
Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.
Lewis Foundry & Machine Co., Farmers Bank Bldg, Pittsburgh, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Mansfield Sheet & Tin Plate Co., The, Mansfield, Ohio
Wheeling Steel Corp., Wheeling, W. Va.

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Dreis & Krump Mfg. Co.,
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Quickwork Co., The, St. Marys, Ohio.
Streine Tool & Mfg. Co., The,
New Bremen, Ohio.
Toledo Machine & Tool Co., Toledo, Ohio.
Yoder Co., The,
5510 Walworth St., Cleveland, O.

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American Sheet & Tin Plate Co.,
Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel Co., Massillon, Ohio.
Columbia Steel Corp.,
Balfour Building, San Francisco, Cal.
Inland Steel Co.,
First National Bank Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, Ohio.
Morris & Bailey Steel Divsion, Oliver Iron & Steel Corp.,
Wilson Station, Pittsburgh, Pa.
Morris, Wheeler & Co.,
30th and Locust Sts., Philadelphia, Pa.
Newport Rolling Mill Co., Newport, Ky.
Otis Steel Co., The,
Leader-News Bldg., Cleveland, Ohio.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Trumbull Steel Co., The, Warren, Ohio.

SHEETS (Automobile)
Allegheny Steel Co., Pittsburgh, Pa.
American Rolling Mill Co., Middletown, Ohio.
Central Steel Co., Massillon, Ohio.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, Ohio.
Otis Steel Co., The,
Leader-News Bldg., Cleveland, Ohio.
Seneca Iron & Steel Co., Buffalo, N. Y.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS (Black)
American Sheet & Tin Plate Co.,
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Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., Hanna Bldg.,
Cleveland, O.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, Ohio.
Newport Rolling Mill Co., Newport, Ky.
Republic Iron & Steel Co., Youngstown, O.
Seneca Iron & Steel Co., Buffalo, N. Y.
Weirton Steel Co., Weirton, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co.,
Youngstown, O.

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American Rolling Mill Co., Middletown, Ohio.
American Sheet & Tin Plate Co.,
Pittsburgh, Pa.
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Bourne-Fuller Co., Hanna Bldg.,
Cleveland, O.
Central Steel Co., Massillon, Ohio.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, O.
Newport Rolling Mill Co., Newport, Ky.
Otis Steel Co., The,
Leader-News Bldg., Cleveland, O.
Republic Iron & Steel Co., Youngstown, O.
Sharon Steel Hoop Co., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co.,
1351 Brown-Marx Bldg.,
Birmingham, Ala.
Trumbull Steel Co., The, Warren, Ohio.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co.,
Philadelphia, Pa.

SHEETS (Box Annealed)
Sharon Steel Hoop Co., Sharon, Pa.

SHEETS (Corrugated)
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Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.

SHEETS (Dead Soft)
American Sheet & Tin Plate Co.,
Pittsburgh, Pa.

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Allegheny Steel Co., Pittsburgh, Pa.
American Rolling Mill Co., Middletown, Ohio.
American Sheet & Tin Plate Co.,
Pittsburgh, Pa.
Central Steel Co., Massillon, Ohio.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, Ohio.
Trumbull Steel Co., The, Warren, Ohio.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS (Galvanized)
American Rolling Mill Co., Middletown, Ohio.
American Sheet & Tin Plate Co.,
Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Morris, Wheeler & Co.,
30th & Locust Streets, Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill.
Trumbull Steel Co., The, Warren, Ohio.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co.,
Youngstown, O.

SHEETS (Perforated)
Erdle Perforating Co., 171 York St.,
Rochester, N. Y.

SHEETS (Roofing) See **ROOFING AND SIDING**

SHEETS (Tin)—See **TIN PLATE**

SHELVING (Steel)
Cleveland Wire Spring Co., The,
1281 E. 38th St., Cleveland, O.

SHERARDIZING FURNACES AND EQUIPMENT
New Haven Sherardizing Co.,
688 Windsor St., New Haven, Conn.

SHIPBUILDING SHAPES
Bethlehem Steel Co., Bethlehem, Pa.

SHOES (Molders' Safety)
Safety First Shoe Co.,
119 Summer St., Boston, Mass.

SHOES (Workmen's)
Safety First Shoe Co.,
119 Summer St., Boston, Mass.

SHOVELS
Wood Shovel & Tool Co., Piqua, Ohio.

SLABS
Andrews Steel Co., Newport, Ky.,
Donner Steel Co., Inc.,
P. O. Box 1000, Buffalo, N. Y.
Mansfield Sheet & Tin Plate Co., The,
Mansfield, Ohio.
Wheeling Steel Corp., Wheeling, W. Va.

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Blake & Johnson Co., The,
185 N. Elm St., Waterbury, Conn.

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Chapman-Stein Furnace Co.,
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Lammert & Mann Co., Chicago, Ill.
Moloch Co., The, Kaukauna, Wis.
Morgan Engineering Co., The, Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Smith Gas Engineering Co., Dayton, Ohio.
Wheeling Mold & Foundry Co.,
Wheeling, W. Va.

SPECIAL SHAPES
Sharon Steel Hoop Co., Sharon, Pa.

SPEED REDUCERS
Jones, W. A., Foundry & Machine Co.,
4437 Roosevelt St., Chicago, Ill.

SPIEGELEISEN
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New Jersey Zinc Co., The,
Maiden Lane and Front St., New York City.
Rogers, Brown & Co., Cincinnati, O.
Samuel, Frank, & Co.,
Harrison Bldg., Philadelphia, Pa.

SPIKES
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Illinois Steel Co., 208 So. La Salle St.,
Chicago, Ill.

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American Hollow Boring Co.,
1055 West 19th St., Erie, Pa.

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Cleveland Wire Spring Co., The,
1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Duer Spring & Mfg. Co., Pittsburgh, Pa.
Gibson, Wm., D., Co.,
1800 Clybourn Ave., Chicago, Ill.
Raymond Mfg. Co., Corry, Pa.
Vanadium Corp. of America,
120 Broadway, New York City.
Wickwire Spencer Steel Corp.,
11 E. 42nd St., New York City.

SPRINGS (Coil and Flat)
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland Wire Spring Co., The,
1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Gibson, Wm. D., Co.,
1800 Clybourn Ave., Chicago, Ill.

SPRING COILING MACHINERY
Sleeper & Hartley, Inc.,
335 Chandler St., Worcester, Mass.

SPROCKETS (Transmission Drive)
Baldwin Chain & Mfg. Co., Worcester, Mass

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Shuster, The F. B., Co., New Haven, Conn.

STACKS (Steel)
American Bridge Co.,
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Heltzel Steel Form & Iron Co., The,
Warren, Ohio
Hendrick Manufacturing Co., Carbondale, Pa
Petroleum Iron Works Co. of Ohio,
Sharon, Pa.
Sotter Bros., Inc., Pottstown, Pa.

STAIR STEPS AND TREADS (Nonslipping)
Irving Iron Works, Long Island City, N. Y.

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Allegheny Steel Co., Pittsburgh, Pa.
Bettcher Stamping & Mfg. Co.,
3106 W. 61st St., Cleveland, O
Bliss, E. W., Co.,
53rd St. and 2nd Ave., Brooklyn, N Y
Crosby Co., 183 Pratt St., Buffalo, N. Y.
Lindsay Chaplet & Mfg. Co.,
Harrison Bldg., Philadelphia, Pa
Newton Pressed Steel & Mfg. Co.,
Newton, Mass
Niles Steel Products Co., The, Niles, Ohio.
Truscon Steel Co.,
615 Wayne St., Detroit, Mich

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Akron-Selle Co., Akron, O.
Chicago Forging & Mfg. Co.,
2004 Southport Ave., Chicago, Ill
Scovill Mfg. Co., Waterbury, Conn.

STARTERS (Electric Motor)
Electric Controller & Mfg. Co., Cleveland.

STEAM SPECIALTIES
Crane Co., The,
836 S. Michigan Ave., Chicago, Ill

STEAMSHIP OCMPANIES
Cleveland & Buffalo Transit Co.,
E. 9th St., Cleveland, Ohio

STEEL
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co.,
431 Carnegie Bldg., Pittsburgh, Pa
Central Steel Co., The, Massillon, Ohio
Illinois Steel Co., 208 So. La Salle St.,
Chicago, Ill
Illinois Steel Warehouse Co.,
1319 Wabansia Ave., Chicago, Ill
Interstate Iron & Steel Co.,
104 S. Michigan Ave., Chicago, Ill
Jones & Laughlin Steel Corp.,
Pittsburgh, Pa
Kidd Drawn Steel Co., Aliquippa, Pa.
Lockhart Iron & Steel Co., Aliquippa, Pa.
Lukens Steel Co., Coatesville, Pa.
Pacific Coast Steel Co., San Francisco, Cal
Phillips, F. R., & Sons Co.,
Pennsylvania Bldg., Philadelphia, Pa
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill
Superior Steel Corp.,
Union Trust Bldg., Pittsburgh, Pa
Walsh & McGee Steel Co.,
2 Rector St., New York City
West Leechburg Steel Co., Pittsburgh, Pa
Wickwire Spencer Steel Corp.,
41 E. 42nd St., New York City
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Agricultural)
Bethlehem Steel Co., Bethlehem, Pa.
Pollak Steel Co., The, Cincinnati, O.

STEEL (Alloy)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co.,
Hanna Bldg., Cleveland, O
Braeburn Alloy Steel Corp.,
Braeburn (Pittsburgh District), Pa
Central Steel Co., Massillon, Ohio.
Donner Steel Co., Inc.,
P. O. Box 1000, Buffalo, N. Y
Firth-Sterling Steel Co., McKeesport, Pa.
Hawkridge Bros.,
Congress St., Boston, Mass
Interstate Iron & Steel Co.,
104 S. Michigan Ave., Chicago, Ill
Lancaster Steel Products Corp.,
Lancaster, Pa
Ryerson, Jos. T., & Son, Inc.,
16th and Rockwell Sts., Chicago, Ill
Vanadium Corp. of America,
120 Broadway, New York City

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Bliss & Laughlin, Inc., Harvey, Ill.
Hawkridge Bros.,
Congress St., Boston, Mass
Kidd Drawn Steel Co., Aliquippa, Pa.
Lancaster Steel Products Corp.,
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Moltrup Steel Products Co.,
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Pittsburgh Tool Steel Wire Co., Monaca, Pa
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Pittsburgh Cold Rolled Steel Co., Verona, Pa.

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Ziv Steel & Wire Co.,
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Braeburn (Pittsburgh District), Pa.

STEEL (High Speed)
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Hanna Bldg., Cleveland, Ohio.
Braeburn Alloy Steel Corp.,
Braeburn (Pittsburgh District), Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Vanadium Alloys Steel Co., Latrobe, Pa.

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Gulf States Steel Co.,
Brown-Marx Bldg., Birmingham, Ala.
Harrisburg Pipe & Pipe Bending Co.,
Harrisburg, Pa.
Washburn Wire Co., Phillipsdale, R. I.

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Lancaster Steel Products Corp.,
Lancaster, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

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Bourne-Fuller Company,
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Central Steel Co., Massillon, Ohio.
Donner Steel Co., Inc.,
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Columbia Steel Co., The, Elyria, O.
Driver-Harris Co., Harrison, N. J.
Greer Steel Co., Dover, Ohio.
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Leader-News Bldg., Cleveland, O.
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Verona, Pa.
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16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp.,
Union Trust Bldg., Pittsburgh, Pa.
Trumbull Steel Co., The, Warren, Ohio.
Weirton Steel Co., Weirton, W. Va.
West Leechburg Steel Co., Pittsburgh, Pa.

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22nd & Washington Ave., Philadelphia, Pa.
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602 Farmers Bank Bldg., Pittsburgh, Pa.
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Hanna Bldg., Cleveland, Ohio.
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Pennsylvania Bldg., Philadelphia, Pa.
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Curry Bldg., Pittsburgh, Pa.
Pollak Steel Co., The, Cincinnati, Ohio.
Republic Iron & Steel Co., Youngstown, Ohio.
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Snead Architectural Iron Works,
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Standard Iron & Steel Co.,
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Union Drawn Steel Co., Beaver Falls, Pa.
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Brown-Marx Bldg., Birmingham, Ala.
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Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Hawkridge Bros.,
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Midvale Co., The,
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STEEL STAMPINGS—See STAMPINGS

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Treadwell Engineering Co., Easton, Pa.

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Shuster, The F. B., & Co.,
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STRIP STEEL (Hot and Cold Rolled)—See STEEL STRIP (Hot and Cold Rolled)

STRUCTURAL IRON AND STEEL—See STEEL (Structural)

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National Acme Co., The,
E. 131st St. and Coit Rd., Cleveland, O.

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Irving Iron Works, Long Island City, N. Y.

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Cleveland-Cliffs Iron Co., Cleveland, O.

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Steel Plate Products Co., Pottstown, Pa.

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Mansfield, Ohio.
Trumbull Steel Co., The, Warren, Ohio.
Weirton Steel Co., Weirton, W. Va.

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TUBES
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Lally Co., Bessemer Bldg., Pittsburgh, Pa.
National Tube Co.,
Frick Bldg., Pittsburgh, Pa.
Weldless Tube Co., The, Wooster, Ohio.

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Hanna Bldg., Cleveland, O.
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National Tube Co.,
Frick Bldg., Pittsburgh, Pa.

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71 Broadway, New York City.
Whiting Corp., Harvey, Ill.

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TWIST DRILLS—See DRILLS (Twist)

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Illinois Malleable Iron Co.,
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Crane Co., The,
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Oxweld Acetylene Co., Newark, N. J.

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McKee, Willis,
2422 Euclid Ave., Cleveland, O.
Morgan Construction Co., Worcester, Mass.

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Pittsburgh Valve, Fdry. & Construction Co.,
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Hanna Bldg., Cleveland, O.
Illinois Steel Warehouse Co.,
1319 Wabansia Ave., Chicago, Ill.
McCalla, Harold, Co., The,
Beach St. and E. Columbia Ave.,
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So. 10th & Muriel Sts., Pittsburgh, Pa.

WASHERS (Iron and Steel)
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Bethlehem Steel Co., Bethlehem, Pa.
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Myers, F. E., & Brother Co., The,
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Pollak Steel Co., Cincinnati, O.
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Davis-Bournonville Co., The,
(Air Reduction Sales Co.)
342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Oxweld Acetylene Co., Newark, N. J.

WELDING AND CUTTING GAS
Prest-O-Lite Co., Inc., The,
Indianapolis, Ind.

WELDING GLASSES
Air Reduction Sales Co.,
342 Madison Ave., New York City.
Oxweld Acetylene Co., Newark, N. J.

WELDING RODS
Air Reduction Sales Co.,
342 Madison Ave., New York City.
Morris, Wheeler & Co.,
30th and Locust Sts., Philadelphia, Pa.
Roebling's, John A., Sons Co., Trenton, N. J.

WELDING RODS AND WIRE
Oxweld Acetylene Co., Newark, N. J.

WHEELS (Car and Locomotive)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co.,
431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co.,
208 S. La Salle St., Chicago, Ill.
Stroh Steel Hardening Process Co.,
Westinghouse Bldg., Pittsburgh, Pa.

WINDOW CLEANING MATERIAL
Skybryte Co., The,
Keith Bldg., Cleveland, O.

WIRE
American Steel Co., Pittsburgh, Pa.
Interstate Iron & Steel Co.,
104 So. Michigan Ave., Chicago, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Seneca Wire & Mfg. Co., The, Fostoria, O.
Washburn Wire Co., Inc.,
118th and Harlem River, New York City.

WIRE (Annealed, Bright, Galvanized)
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Corp.,
Balfour Bldg., San Francisco, Cal.
Pittsburgh Steel Co.,
P. O. Box 72, Pittsburgh, Pa.
Seneca Wire & Manufacturing Co., The,
Fostoria, Ohio.

WIRE (Electric Resistance)
Driver-Harris Co., Harrison, N. J.

WIRE (Fence)
American Steel & Wire Co.,
208 S. La Salle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co.,
P. O. Box 72, Pittsburgh, Pa.
Youngstown Sheet & Tube Co.,
Youngstown, O.

WIRE (Round, Flat, Square and Special Shapes)
Roebling's, John A., Sons Co.,
Trenton, N. J.

WIRE (Threaded)
Progressive Mfg. Co., Torrington, Conn.

WIRE (Welding)—See WELDING RODS WIRE AND WIRE WORKERS' SUPPLIES
McCalla, The Harold, Co.,
Beach St. and E. Columbia Ave.,
Philadelphia, Pa.

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Cleveland Wire Cloth & Mfg. Co.,
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Wickwire Spencer Steel Corp.,
41 E. 42nd St., New York City.

WIRE MILL MACHINERY
National Machinery Co., Tiffin, Ohio.
Shuster, The F. B., Co., New Haven, Conn.
Treadwell Engineering Co., Easton, Pa.

WIRE MILL MACHINERY (Equipment Complete)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The,
Cuyahoga Falls, O.

WIRE NAIL MACHINERY
Sleeper & Hartley, Inc.,
335 Chandler St., Worcester, Mass.
Vaughn Machinery Co., The,
Cuyahoga Falls, O.

WIRE NAILS—See NAILS

WIRE RODS
Bethlehem Steel Co., Bethlehem, Pa.

WIRE ROPE AND FITTINGS
American Steel & Wire Co.,
208 So. La Salle St., Chicago, Ill.
Bourne-Fuller Co.,
Hanna Bldg., Cleveland, O.
Roebling's, John A., & Sons Co.,
Trenton, N. J.

WIRE STRAIGHTENING AND CUTTING MACHINES
Shuster, The F. B., Co., New Haven, Conn.

WIRE, WIRE RODS AND WIRE PRODUCTS
American Steel & Wire Co.,
208 So. La Salle St., Chicago, Ill.
Columbia Steel Corp.,
Balfour Bldg., San Francisco, Cal.
Gulf States Steel Co.,
Brown-Marx Bldg., Birmingham, Ala.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Roebling's, John A., & Sons Co.,
Trenton, N. J.
Wickwire-Spencer Steel Corp.,
41 E. 42nd St., New York City.

WOOD BLOCK FLOORING (Creosoted)
Republic Creosoting Co.,
Merchants Bank Bldg., Indianapolis, Ind.

WRENCHES
Drop Forging Co. of New York,
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ZINC
New Jersey Zinc Co., The,
Maiden Lane & Front St.,
New York City.

ZIRCONIUM METAL AND ALLOYS
Electro Metallurgical Sales Corp.,
30 E. 42nd St., New York City.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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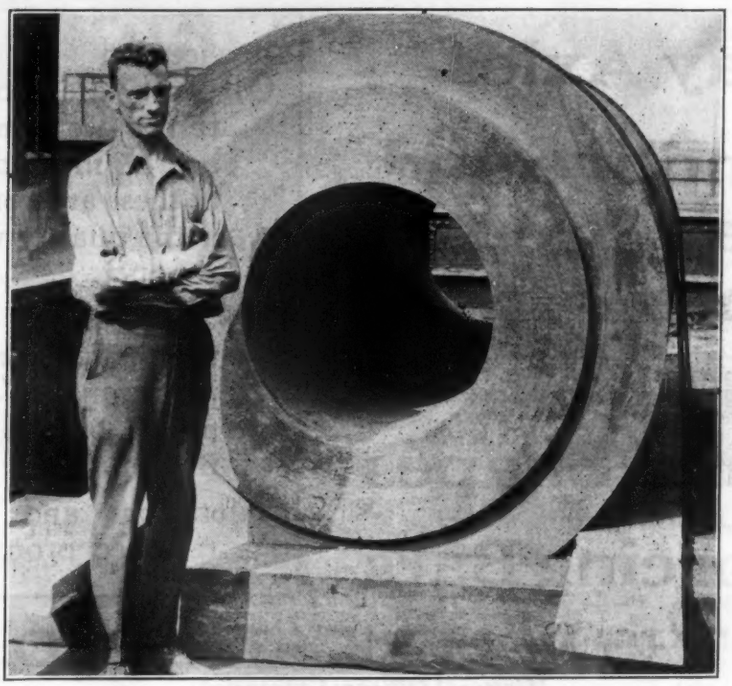
HOLLOW FORGINGS



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WELDLESS RINGS CARBON or ALLOY BILLETS

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DISTRICT OFFICES:

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BOSTON PHILADELPHIA CLEVELAND CHICAGO SAN FRANCISCO

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POLLAK

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Automotive and Railway Drop Forgings

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Quotations and blue prints returned promptly.

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General Offices: Cincinnati
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Have Your Forgings made in Rockford—

We can save you money—give you accurate high grade forgings promptly and in quantities. Send samples or blue prints for quotations.

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ROCKFORD, ILLINOIS

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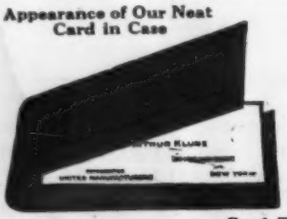
PEERLESS PATENT BOOK FORM CARD

Appearance of Our Neat Card in Case



That they are the best admits of no discussion. The best men everywhere use them. If you don't it is only because you have not examined them. They are always carried together and they carry conviction. They are always smooth edged when you detach them and they are always clean and flat. They leave nothing to be desired, however fastidious the taste, or severely critical the judgment.

Send today for sample tab and detach the cards one by one—satisfy yourself as to what others universally call best.

Send Today

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by

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530 IF

If you have used machinery or equipment that you want to sell to someone in the metalworking industry, why not put the World's Greatest Salesman on the job?

This salesman is the "For Sale" Classified Advertisement.

All over the land, thousands of articles ranging from those of small value to property of multi-figure value, are being sold by this indefatigable worker.

In the metalworking industry this salesman works quickly and efficiently through the Classified Section of Iron Trade Review.

Make mental inventory now of the surplus tools on hand which may be very useful to some other plant. Then write out an ad, telling plainly what you have to sell. Be specific. Your advertisement must lead the reader to feel that the machinery you offer meets his purpose. Send your advertisement on to the Classified Advertising Department of Iron Trade Review.

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664

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is noted for its easy, positive control. It is a complete crane unit—self contained, self oiling.

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ELECTRIC HOISTS—AIR HOISTS

NORTHERN ENGINEERING WORKS
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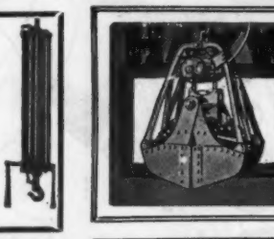

First aid to overworked labor and over-burdened payroll. Self-contained, easily and fully controllable, speedy digging and rehandling machine for indoor or outdoor use. Hooked up in a jiffy to any lifting machine. Catalog 44.

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Traveling Cranes
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Price is a small fraction of any other type of Power Hoist

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HARVEY-ILL. U.S.A.
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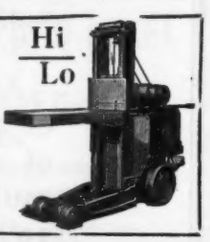

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Made in various sizes. Get our Bucket Bulletin.

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Write for bulletins.

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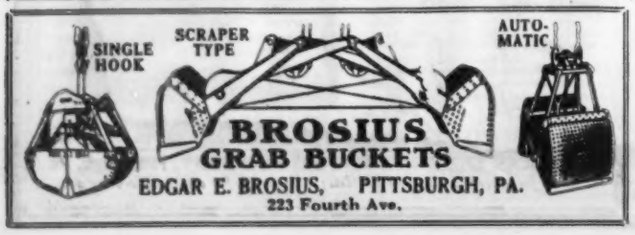

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Clean Cut Perforations
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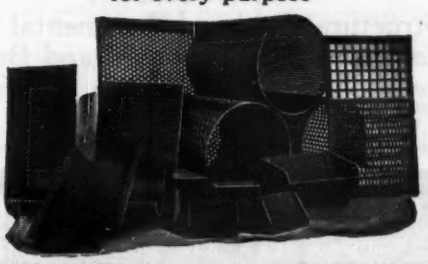
for every purpose



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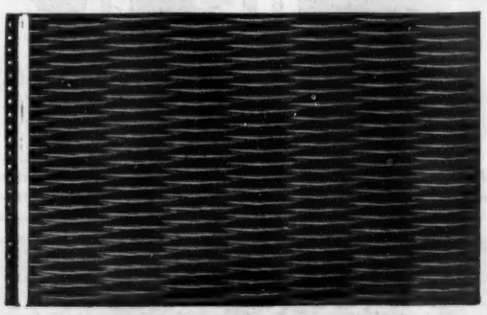

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AMERICAN PRESSED STEEL CO.
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Black and Galvanized
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Special shapes in soft and tool steel
Write for "Decimal Equivalent Chart."

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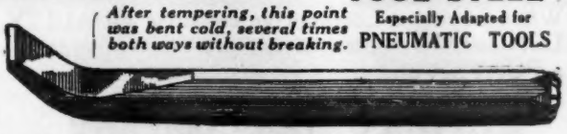
After tempering, this point was bent cold, several times both ways without breaking.

Especially Adapted for PNEUMATIC TOOLS



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Facilities, Location, Complete Stocks of Standard Shapes and Sizes mean prompt shipments and real cooperation in Tool Steel problems.
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The Tool Steel Mill BRAEBURN, PA. (PITTSBURGH DISTRICT)

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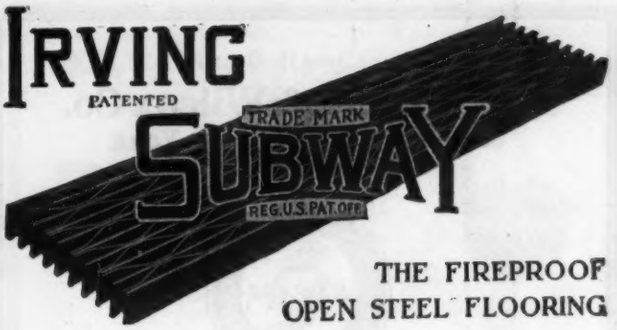

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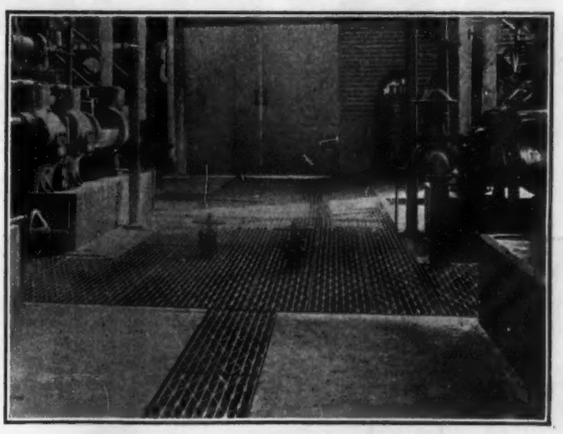
Forget the word "grating" and think of **Subway** as a true flooring. Picture it as a flooring in any part of your plant, for any purpose whatsoever—and your imagination will not paint its advantages in too glowing colors. Smooth, safe, non-slipping—serviceable and satisfaction-full—light in weight and low in first cost, with no after-costs—cool and ventilating and light-saving—these are some of the qualities which have made **Irving Subway** the unusual industrial flooring. Write for Catalog 4A-32.



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ABSOLUTELY NON-SLIPPING ALWAYS

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Established 1868

Water Tube Boilers
Steam Superheaters
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Detroit, Ford Building
Cincinnati, Traction Building
Atlanta, Candler Building
Phoenix, Ariz., Heard Building
New Orleans, 521-5 Baronne Street
Houston, Texas, Southern Pacific Building
Dallas, Texas, 2001 Magnolia Building
Denver, 435 Seventeenth Street
Salt Lake City, 705-6 Kearns Building
San Francisco, Sheldon Building
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Tanks—High Pressure and Storage—Regular and Special to Order—Copper Brazed, Riveted or Welded—Gasoline Storage Tanks and Pumps—Structural and Machine Work.

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that are really efficient

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No matter what your requirements may be we can build you a boiler that will meet them exactly.
Drop us a line and let us know what you need.
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Stacks—Condensers—Chemical Equipment.
Steel Plate Construction Work of All Kinds.
Electric Welding one of our specialties.

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Established 1869 **POTTSTOWN, PA.**

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PITTSBURGH TANKS For INDUSTRIAL SERVICE

& Structural Steel Work

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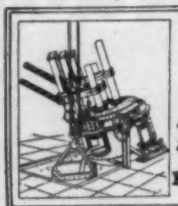

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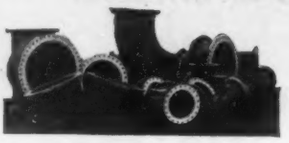

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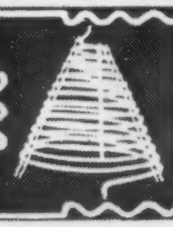

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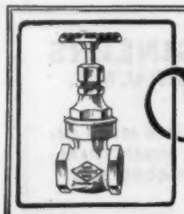

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IRON TRADE REVIEW

Resale Equipment News

Current Announcements and News of Plant Liquidations, Public Auctions of Equipment, Proposals, Bids, Sales, Etc.

June 26, 1924

SHIPBUILDING yards and the war plant built at Gloucester, N. J., by the Pusey & Jones Co. are to be sold at public auction June 26 at 2 p. m. by Joseph P. Day, 67 Liberty street, New York, auctioneer. The sale will be in the administration building on the premises of the shipyards. The property includes 179 acres of land, a number of brick and steel manufacturing and administration buildings, a power plant, machinery, cranes, etc.

To meet requirements of those who want to purchase the plant in entirety or in part, the following methods of sale have been adopted by the ancillary receivers, Willard Saulsbury, Charles B. Evans and Joseph P. Tumulty: 1. The real estate, including buildings, machinery, tools, equipment, etc., to be offered as a whole. 2. All real estate and buildings will be offered as a whole without machinery. 3. The machinery will be ofefered as a whole without the estate. 4. The real estate will be offered in seven different parcels, with machinery, tools, appliances, on those parcels. 5. The machinery and personal property will be sold item by item as designated by the receivers.

* * *

The auction house of Samuel T. Freeman & Co., Philadelphia, on July 1 will be moved from 1519 to 1808 Chestnut street, that city.

* * *

Punches, anvils, reamers, wheelbarrows, track jacks, bushings, axes, bits, drills, twist drills, and many other classes of small tools and miscellaneous equipment will be sold at public auction July 1 at 10 a.m. at the Rock Island arsenal, Rock Island, Ill.

* * *

Machine tools disposed of at the recent auction of the plant and equipment of the Lake Torpedo Boat Co., Bridgeport, Conn., particularly those of the later types, brought what the trade generally regarded as good prices. Fairly indicative was the sale of a lathe manufactured by Lodge & Shipley Machine Tool Co., for $3600, this comparing with possibly $7500 for a new machine of the same type. On machines of older model the bidding was not as active. A modern floor type boring mill, yet not of the latest design, costing perhaps $12,000 when new, went at $2500. Dealers participated chiefly in the bidding, users of machinery being well in the minority. Between 350 and 400 machines were listed. The auctioneers were Samuel T. Freeman & Co., Philadelphia.

* * *

Joseph P. Day, 67 Liberty street, New York, auctioneer, will sell on June 27 at noon in the chambers of chancery court, 75 Montgomery street, Jersey City, N. J., the plant of the Stowell Mfg. Co., with 10 car siding of the Central Railroad of New Jersey, at 244-60 Culver avenue, Jersey City, N. J. Several buildings, a boiler house, and other equipment and accessories will be sold.

* * *

American & British Mfg. Co., Crescent avenue, Bridgeport, Conn., will be sold at public auction June 30 at 10 a.m., by Gerth's Realty Experts, 505 Fifth avenue, New York. Included in the equipment to be sold are lathes, shapers, presses, boring mills, planers, radial drills, testing machinery, punch and stamping presses, motors, grinders, shears, band saws, tin and pipe shop equipment, powerhouse equipment, etc.

* * *

The assets of the bankrupt K. & F. Mfg. Co., 603 Pleasant street, Kenosha, Wis, have been sold by the trustee to Charles W. Keating 432 Fremont avenue, that city, for $30,000. The appraised value is in excess of $100,000. The company manufactured automobile locks, hardware specialties, tools jigs and dies. The trustee has continued operations to fill a large contract for locks.

* * *

May Foundry Co., Sixty-first street and Eastwick avenue, Philadelphia, will be sold at public auction July 1 at 11 a. m., by Samuel T. Freeman & Co., that city auctioneers. Complete iron foundry equipment, including air compressors, cranes, cupola, positive pressure blower, motors, pattern making machinery, flasks, core ovens, jolters, etc, will be sold in separate lots. The company operates gray iron, brass and aluminum foundries and a pattern shop.

Sales Calendar

June 26—Pusey & Jones shipbuilding plant at Gloucester City, N. J., by J. P. Tumulty, Williard Saulsbury and C. B. Evans, receivers. Joseph P. Day, 67 Liberty street, New York, is auctioneer.

June 26—Peter Lyall plant, Montreal, Que., and Motor Trucks, Ltd., Brantford, Ont. Bids will be received by quartermaster general until 11 a.m., at 2026 Munitions building, Washington.

June 27—Stowell Mfg. Co., plant site, 244 Culver avenue, Jersey City, N. J., by Joseph P. Day, 67 Liberty street, New York, auctioneer.

June 27—Perkasie Forge & Machine Co., Perkasie, Pa., at public auction by Samuel T. Freeman & Co., Philadelphia, auctioneers.

June 30—American & British Mfg. Co., Bridgeport, Conn., at public auction by Gerth's Realty Experts, 505 Fifth avenue, New York, auctioneers.

July 1—Rock Island Arsenal, Rock Island, Ill., will auction small tools and equipment.

July 1—May Foundry Co., Sixty-first street and Eastwick avenue, Philadelphia, at auction by Samuel T. Freeman & Co., that city, auctioneers.

July 7—New York Railways Co., New York, at public auction, equipment, etc., by Stetson, Jennings, Russell & Davis, 15 Broad street, New York.

July 8—Electrical equipment at Camp Custer, Mich., by the war department.

July 10—Swebell Bros. Co., Milwaukee, Wis., at public auction by Otto H. Wadewitz, receiver.

July 16—Herald Mfg. & Trading Corp., Kingsland avenue and Hamilton street, Harrison, N. J., at public auction by Charles Levy, that city, auctioneer.

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Compressors, 242, 442 and 519 cu. ft., belted.
Compressors, 1700 and 2400 cu. ft. steam.
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Grinder, No. 4 Gardner Disc.
Grinder, 10" x 32"; Ott Universal.
Grinder, 12" x 48" Cincinnati Universal.
Lathe, 24" x 26' American, M.D.
Lathe, 17" x 12' LeBlond, Grd. Hd.,T.A.,M.D.
Lathe, 15" x 8' Putnam, taper attachment.
Lathe, 14" x 6' Hendey, taper attachment.
Lathe, 14" x 6' Monarch, Q.C.G., T.A.
Miller, No. 3 B. & S. Vertical M.D.
Pipe Machine, 4" Cox Belt Drive.
Pipe Machine, 12" Stoever.
Pipe Machine, 6" Landis, like new.
Pipe Machine, 10" Jarecki, 12" B. & K.
Planer, 30" x 30" x 8' Flather, 1 head.
Planer, 72" x 72" x 12' Pond, 3 heads.
Planer, Rotary, 60" Newton, M.D.
Presses, No. 75½ Bliss Geared (2).
Press, Dbl. Crank, 40" Bet. housings, 24,000 lbs.
Shear, 156" x ¾" plate, M.D.
Shear 126" x ¾ plate, 18" gap.
Shears, Guillotine, cap. 1", 2" and 2½".
Shears, Alligator, cap. 3", 4", 4½".
Shear, ¾" Lennox Rotary Bevel, belted.
Shear, ¼" Niagara, circle, 25" throat.
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Shaper, 16" Putnam friction type (cheap).
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3½' PRENTICE Plain Radial Drill.
4' MUELLER Heavy Duty Radial, motor dr.
5' REED-PRENTICE Hvy. Duty Radial Drill.
Twelve Spindle PRATT & WHITNEY Multiple Spindle Drill, cap. 1⅛" drills.
30" x 30" x 8' & 12' GRAY Planers, 2 hds.
36" x 36" x 10' CINCINNATI Planer, 4 heads.
48" x 48" x 14' POWELL Planer, 4 heads.

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4500 lb. BEMENT Steam Forging Hammer.
7' BAUSH Motor Driven Radial Drill.
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79" PUTNAM Locomotive Driving Wheel Lathe.

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44" PUTNAM Vertical Boring Mill, like new.
42" BULLARD Vertical Boring Mill (3).
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10" BETTS Heavy Duty Slotter, belt driven.
26" & 36" BROWN & SHARPE Gear Cutters.
100-600 lbs. MINER&PECK Drop Presses (7).
600 lb. LANE Steam Drop Hammer.
1100 lb. N-B-P Steam Forging Hammer.
4" COX Pipe Machine, belt drive.
6" COX Motor Driven Pipe Machine.
8" E. C. & B. Pipe Threading Machine.
No. 2 W. & W. Bender and Straightener.
NEWBOLD Billet Shear, cap. 6 x 6".
MARSHALLTOWN Throatless Shear, ⅜" plate, NEW.
¾" KLING Rotary Splitting Shear.
36" McCABE S. E. Punch and Shear, 1" x 1".
36" (No. 1) LONG & ALSTATTER S. E Punch and Shear 1½" x 1".
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1—Quickwork No. 4B Rotary Shear.
1—New Quickwork No. 6 Rotary Shear.
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1—Putnam 48" x 48" x 12' Planer, 2 hds., motor drive.
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4" Ajax, Steel Bed, Side Shear: A-1 Condition.

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Millers, Plain, 1½ Rockford, 3-H LeBlond.
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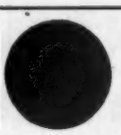

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Rock River Power Bending Roll; pyramid type; capacity ½" plate by 10' 2"; 10' 2" between housings; dro› end housings; power device for raising and lowering top roll; direct connected to 15 H.P. General Electric 220 v., 3 phase, 60 cycle, A.C., variable speed, reversible motor, with electrical control; practically new;

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Long and Alstatter No. 3 Squaring Shear; capacity ¼" and lighter by 6'; 18" throat; 72" between housings; a beautiful tool;

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1—72" x 35' Bement HD Engine Lathe.
1—54" x 34' Bement HD Triple Geared.
1—48" x 15' N-B-P Screw Cutting, cone drive.
1—42" x 34' Pond Triple Geared Lathe.
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1—34" x 21' Pond Lathe.
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1—26" x 22' Boye-Emmes, with Motor, Taper.
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1—No. 4 Beaman-Smith Floor Type Boring Mill.
1—18" Libby Turret Lathe.
1—21", 24" and 28" Gisholt Turret.
1—No. 3-A Warner-Swasey Hollow Hexagon Turret.
3—Gridley Single Spindle Auto. 2¼", 3¼".
1—20", 24" and 36" Bement Slotter.
1—24" American; 24" Stockbridge Shapers.
1—14" Fay Automatic Turning Lathe.
1—No. 2 Cincinnati Universal Miller.
1—No. 2-B Milwaukee Plain, double overarm.
1—No. 1-B Univ. Milwaukee late type double arm.
1—No. 4 and No. 5 Cincinnati Plain, S.P.D.
1—28" Barnes Four Spindle Sliding Head Drill.
1—5' Bickford Radial, Rd. Col. Gear Box, Tapp. Att.
1—4½' & 2½' Mueller Radial.
2—2' Mueller Radials.
1—12-spindle Bausch Drill, type 24-C.
1—60" x 60" x 14' Powell Planer, two heads.
1—60" x 60" x 20' N-B-P Late Type Planer.
1—36" x 36" x 24' Sellers Extension Bed.
1—36" x 36" x 14' Pond Planer.
1—36" x 36" x 8' Detrick-Harvey 1 hd.
1—32" x 32" x 10' Gleason, two heads, excellent.
1—No. 13 Brown-Sharpe Grinder.
1—1000 lb. Williams-White Board Drop Hammer.
1—2500 lb. Bement Double Arch Hammer.
1—600 lb. Brown-Sharpe Model B Drop Hammer.
1—12,000 lb. Bement Steam Drop Hammer.
1—3" Acme Upsetter.
1—No. 2-A Newark 24" Gear Cutter.

Write for Simmons' Pictorial News

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Albany, N. Y.
1210 Troy Road

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Reed-Prentice 36" High Speed Drill.
Bickford 4', Pond 6½'-8' Radial Drills.
Morse Silent Chain Belt 8" x 16', 1¼" pitch.
Brown & Sharpe No. 13 Auto. Gear Cutters.
Landis No. 3 Universal Grinder, 12" x 42".
Bradley 25-lb. Helve, W.W. 55-lb. Upr. Hammers.
Cleveland, Blaisdell, South Bend Lathes.
16" x 6', Sidney 18" x 8', Putnam 26" x 20'.
28" x 14', Johnson 50" x 49½' Triple Geared.
Detrick-Harvey 30" x 30" x 13' Openside Planer.
Canton No. 5 Alligator Shear, 24" knives, 3" cap.
Niagara Foot Power Sq. Shear, cap. 10'-18 ga.
Wais & Roos Pr. Sq. Shear, cap. 48" x ⅜".
Ingersoll Slab Miller 30" x 30" x 12'.
Lewis Angle Straightening Rolls, cap. 3" x 2½".
Niles 15" Slotter, 30" rotary table.
Electric Welder, 100 KW, 60 cycle.
Abramsen No. 2 Bar Straightening Machine.
McCabe Pneumatic Flanging Machine.

RUSSELL MACHINE COMPANY
Pittsburgh, Pa.

JUST RECEIVED FOR STOCK

1—20" Gisholt Automatic Turret Lathe; single pulley drive; suitable for heavy Chucking work. Excellent condition. Immediate shipment. Low price.

Wire, Write or Phone for Full Details

RIVERSIDE MACHINERY DEPOT
251 St. Aubin Avenue
DETROIT, MICHIGAN

These Used Tools Are in Exceptional Condition. Some Are Practically New

MILLING MACHINES

No. 3 Miller & Crowningshield, hand.
No. 6 Whitney, hand and weight feeds.
No. 1 Kempsmith Universal, latest type.
No. 2 Cincinnati Universal, cone.
No. 2 Cincinnati Universal, back geared, cone.
No. 3 Cincinnati Plain, cone.
No. 5 Kempsmith Plain, cone.
No. 7 Brown & Sharpe Plain, cone.
No. 1½ Rockford Plain, latest type.
Model C Becker Vertical, high power.
Model B-1 Becker, power down feed.
No. 4-B Becker Vertical.
No. 5-B Becker Vertical, with rotary.
No. 25 Becker Type, Standard.
No. 2 Cincinnati Vertical, with rotary.

SHEARS

No. 3 Ryerson Comb. Punching and Shearing, steel frame, high power, quintuple.
No. 2 Ryerson "Lennox" Rotary Bevel Shear, ¾".

Lynd-Farquhar Company
Used Tool Dept. Boston, Mass.

Play Safe!

BUY USED machinery from the Vonnegut Good-As-New Department. You will get values at bargain prices without taking any chances. The Vonnegut Guarantee protects you. Our monthly stock list carries many specials. Ask to be put on the mailing list.

VONNEGUT MACHINERY CO.
Arthur S. Day, Manager
GOOD-AS-NEW DEPARTMENT
Indianapolis, Indiana

No. P-1 Ferracute PRESS.
No. 3—16' Niles PLATE PLANER.
No. 6½ H. & J. GATE SHEAR.
8' Stoll Power SQ. SHEAR, No. 14 Ga.
No. 696 Niagara GAP SHEAR, 10 Ga.
No. 134 Lennox ROTARY SPLIT SHEAR.
48" tht. Cleveland "EF" S.E. PUNCH, 1¼" x 1", with motor.
No. 512 Niagara S.S. POWER PRESS.
Hansell-Elcock Hvy. Duty RAIL BENDER.

Details gladly sent

THE E. L. ESSLEY MACHINERY CO.
551-557 W. Washington Blvd., Chicago, Ill.

4" x 4" x ½"
BERTSCH
ANGLE BENDING ROLL
Arranged for motor drive
First Class Condition

MILES MACHINERY CO.
Saginaw, Mich.

ELECTRIC WELDERS
Money-Back Guarantee
10—200 ampere Lincoln motor generator sets, 220-440 volts, 3 phase, 60 cycle.
2—600 ampere Wilson motor generator sets, 220-440 volts, 3 phase, 60 cycle, arranged for 4 operators.
M. D. GOODMAN
The Electric Specialist
185 Bigelow St., Newark, N. J.

Locomotive Cranes
6 Industrial
4 Wheels 40' Booms
5—15 Tons, each.....$1,000
1—20 Ton..... 1,850
Boilers inspected for 125 lbs.
MARVIN BRIGGS, Inc.
167 Sixth St. Brooklyn, N. Y.

IDEAL YARD CRANE
5 ton, 97' span.
3 motor Overhead Electric Traveling Type. 95% new. Immediate delivery car or boat New York. Also 375 ft. Double Steel Runway Girders and rails.
N. B. PAYNE & CO.
Crane Specialists
26 Cortlant St. New York
Telephone Rector 9080

LOCOMOTIVE CRANE
Type L 40 ton capacity INDUSTRIAL like new, ASME boiler, 70' boom, double drums, complete with outriggers, ballast and cable.
6 other Cranes.
PHILIP T. KING
"The Crane Man"
30 CHURCH ST. NEW YORK

CRANES
2—6 Ton hand operated, 36 ft. span, with runways and supporting columns. Practically new. $800 each.
Power Machinery Exchange, Inc.
1 Montgomery Street
Jersey City, N. J.

CRANE BRIDGE
15 tons capacity—88' 0" span, in good condition. Complete with End Trucks and Drive. Can furnish alternating or direct current motor. Trolley can be supplied to meet buyer's requirements.
One Direct Connected Steam Generator Set

Engine	*Generator*
Ball & Wood High Speed	Bullock
10½" Bore	Volts—240
10" Stroke	Amp.—120
4" Shaft	R. P. M.—275
4'-0" Dia. Flywheel	Switchboard, with
Center Crank	breaker, volt and
Automatic Oil Feed	ammeter

Floor Space—7'-0" x 8'-0"
Chesapeake Iron Works
BALTIMORE, MD.

Relaying Rails
NEW RAILS - ACCESSORIES
Buy Guaranteed Relaying Rails and Save 30% to 50%
1 Ton or 1000
L. B. FOSTER CO.
PITTSBURGH, PA. NEW YORK CITY
JERSEY CITY PHILADELPHIA HAMILTON, O.

Rails and Mine Cars
Rails—all Sections—New and Relaying. Also Frogs and Switches. Bridge Girders and I-Beams, all sizes. New Mine Cars of most all gauges in stock for immediate shipment.
M. K. FRANK
Union Trust Bldg., Pittsburgh, Pa.
New York Office: 15 Park Row Building

SCALES
Write for Bulletin No. 20, listing 10 tons, 15 tons, 60 tons and 100 tons Platform Scales.
Nashville Industrial Corporation
Old Hickory, Tennessee

25 Ton 4 Motor Crane
1—80' span 25 ton Northern Crane 5 ton Aux. motors 3 phase 60 cycle 220 volts.
This crane practically new—Never erected—Inspection our Warehouse.
Scully-Jones & Co.
2012 W. 13th St. Chicago

OVERHEAD CRANES
All direct current motors
3—5 ton Northern 3 motor Cranes, Type E, 50-60' span, 25' lift.
1—5 ton P. & H. Wall Crane, 15' lift, 22' reach.
1—10 ton Toledo, 16' lift, 33' span.
2—25 ton Northern, 30' lift, 54' span.
1—50 ton Northern, with 2—25 ton trolleys, 30' lift, 54' span.

OTHER EQUIPMENT
6—Houston Stanwood Gamble Michigan Standard Boilers, 72" x 18'.
37—20' Jib Cranes.
1—1500 lb. and 2-2000 lb. Steam Hammers.
1—16' Bending Roll.
2—2000' Steam Driven Laidlaw Air Compressors.
1—No. 3 B Milwaukee Milling Machine.
Punches, Shears, Lathes, Bolt Cutters and Threaders, Pipe Machines, Radial Drills, Drill Presses and Wood Working Machinery.
Direct Current Motors 5 to 40 H. P.
The American Shipbuilding Co.
Ft. of W. 54th St., Cleveland, Ohio

MOTOR FOR SALE
1—25 H.P. General Electric Motor, induction type, 60 cycle, 220 volts, A.C. In first class condition. Price $175.00. Cortland Foundry & Machine Co., Cortland, N. Y.

BOX CARS
25—Steel Underframe, 80,000 lb. cap.
100—Steel Underframe, 60,000 lb. cap.
16—Steel Underframe, Refrigerator.
ZELNICKER IN ST. LOUIS
Locomotives, Rails, Steel Piling.
Bulletin 325 in press.

A Large Audience

Suppose we could gather together a greater number of men than will in person listen to the average campaign speech of the presidential candidates.

Suppose also, that each man in the audience was actively engaged in the machinery and metalworking fields.

Wouldn't such an assemblage constitute a good audience before which to make an offer of buying, selling, employing, etc.? No matter what proposition you would make, so long as it possessed merit and was connected intimately with their every day activity, you would feel very certain that someone in that audience would be interested.

You can reach such an audience—*even larger*—and made up of the livest wires in the metalworking industry. Here's how you can do it—and with very moderate expenditure!

Insert a Classified Advertisement in IRON TRADE REVIEW. Each week they are producing results for men who are buying, selling, seeking business opportunities, strengthening their organizations, etc.

Look carefully over the Classified Advertisements in this issue. See how others are using them. It is likely too, that you will then want to send us one.

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Equipment Wanted

For Machine Shops, Foundries, Iron and Steel Works, Mines, Railroads and Metal-Working Plants Generally

Advertising Rates: 1" One Time $5.00; 2" One Time $9.50; 3" One Time $14.00; 4" One Time $18.00
RATES FOR LARGER SPACE OR LONGER PERIODS FURNISHED ON REQUEST

PUMPS WANTED

Outside end packed duplex Pot Valve, bronze plunger steam pumps. ALL SIZES.

WICKES MACHINERY CO.
Claremont & West Side Aves.
Jersey City, N. J.

WANTED
Used Car Wheel
BORING MACHINE
Advise condition and price
Address Box 220
IRON TRADE REVIEW CLEVELAND

BOILERS WANTED

2—250 H.P. used Heine Boilers or equivalent. Working pressure, 180 to 200 pounds. Address Box 231, IRON TRADE REVIEW, Cleveland.

Opportunities

Advertisements in this section are referred to by those seeking plants and plant sites, miscellaneous semi-finished and finished raw materials; by those who desire agencies.
Advertising Rates: 1" One Time $5.00; 2" One Time $9.50; 3" One Time $14.00; 4" One Time $18.00

FOR SALE
BLAST FURNACE
ORE MINES—QUARRY
Spring Valley Iron and Ore Co.
Spring Valley, Wisconsin

Representation Wanted

An established manufacturer of Die Blocks, Trimmer Steels and other Drop Forge supplies, would like to make a selling arrangement, on a commission basis, with a well established firm, or an individual, to handle their product in the New England States; also one for New York City and New Jersey.

Address Box 227,
IRON TRADE REVIEW, Cleveland

OMAHA OPPORTUNITY

Omaha needs a commercial forging plant. We have the building with trackage and machinery. We will sell on easy payments or rent with privilege of purchase. You can make our forgings for us. Here is a chance to get in business for yourself with limited capital. Investigate this.

Little Red Wagon Mfg. Co.
(Stroud & Co., Successors) 20th & Ames, Omaha

ATTRACTIVE BARGAIN

3—One ton P & H 2 motor, 2 phase, 60 cycle, 220 volt, Electric Hoists. Complete with floor control and designed so that hoist will raise the load as well as move it on a trolley. Excellent condition.

Consolidated Products Company, Inc.,
15 Park Row New York City

Wanted
STEEL PILING

12 to 20 ft. long. Will take longer lengths for cutting on job.

Address Box 219
IRON TRADE REVIEW, Cleveland

Now is the time to buy!

"We found the equipment we wanted through our little inch advertisement. No "For Sale advertising had appeared recently offering what we needed, but our want ad brought us several quotations."

The foregoing is the expression received from a recent advertiser.

Do you need anything?

Save time and money by advertising your wants to the thousands of readers of IRON TRADE REVIEW. Some of them will have to sell just what you need. 608

For sale or exchange

GRAY IRON FOUNDRY

Chicago district. Capacity 50 molders. Fully equipped. No. 9 Whiting cupola. Two switch tracks. Reinforced concrete charging floor, served by elevated track. Address Box 215, IRON TRADE REVIEW, Cleveland.

FOR SALE
FOUNDRY PLANT

Concrete building 60 x 400 feet, land 250 x 600 feet, trackage, cupola, traveling cranes, motors, jolters, cinder mill and miscellaneous machinery.

Address Box 226
IRON TRADE REVIEW, Cleveland

Opportunities of value are offered here always

Employment

POSITIONS OFFERED Minimum ad., 50 words, $3.00 Additional words, $.06 each

When a box address is desired count seven words in addition to your copy

POSITIONS WANTED Minimum ad., 30 words, $1.00 Additional words, $.03

Positions Offered

WANTED:—REPUTABLE REPRESENTAtives in Middle Atlantic and New England States to sell on a commission basis production and contract castings in brass, bronze, aluminum and monel. Communicate with Northern Bronze Corporation, 4212-20 Cresson St., Phila., Pa., stating present lines and any other likely information.

GOOD SALESMEN
ARE WANTED

From recent indications, it seems that the metalworking industry is in need of real, energetic salesmen.

A number of good opportunities are awaiting capable salesmen. Several such positions have been offered and filled recently through advertisements in this column.

If you are an A-1 salesman and are seeking a position, it will be worth your while to watch the advertisements that appear under this heading each week.

Another way to overtake Opportunity is to insert an advertisement under the Positions Wanted heading for two or three issues.

SUPERINTENDENTS, EXECUTIVES, ENgineers, now engaged, $3,000-$25,000, seeking new connections, will find our individual, confidential service an effective and dignified medium to make connections desired. Since 1919 personally conducted by MR. JACOB PENN, the eminent employment authority, known to leading business men throughout America. Present and past associations undisturbed. Not employment agency. INQUIRIES SOLICITED ONLY FROM PERSONS WITH RECORDS OF SUCCESSFUL PERFORMANCE AND STABILITY.

JACOB PENN, INC.,
305 BROADWAY, NEW YORK CITY

WANTED:—A MAN CAPABLE OF SELLing iron and steel rolls. Man with experience preferred, although this is not absolutely necessary. Good position for right man. Address Box 223, IRON TRADE REVIEW, Cleveland.

Positions Offered

WANTED:—MECHANICAL ENGINEER to work on design of sheet steel and plate forming machinery. Technical school graduate who has had practical experience. Location small central states town. Address Box 212, IRON TRADE REVIEW, Cleveland.

WANTED:—THOROUGHLY EXPERIenced cold rolled strip steel salesman for middle western states. One with established trade preferred. State former connections, etc. Address Box 229, IRON TRADE REVIEW, Cleveland.

Positions Wanted

OPEN HEARTH SUPERINTENDENT. Technical Education. Expert in practical operation and furnace construction. Address Box 217, IRON TRADE REVIEW, Cleveland.

THIS IS THE PLACE

where men engaged in every capacity in the metalworking field can offer their services to the executives of the industry.

Through an advertisement in this column, the man who is seeking a position can put his proposition before hundreds of big employers. He can briefly give his experience and say enough in a few words to give an executive a glimpse of his capabilities.

In fact, he can be assured of locating a position through an advertisement here, provided the job his abilities qualify him for is open.

ESTIMATOR AND OUTSIDE ERECTION superintendent, age 35, wishes position with established ornamental and structural shop or contractor. West or middle west. Fifteen years experience. Correspondence solicited. Address Box 224, IRON TRADE REVIEW, Cleveland.

WORKS MANAGER, LONG AND VARied experience. Successful systematizer. Low production costs. Address Box 230, IRON TRADE REVIEW, Cleveland.

Positions Wanted

ROLLING MILL SUPERINTENDENT. A most competent man can be had at once. Experience covers twenty years. A thorough executive, married and highest character. I am not a job hunter but very unusual circumstances make my services available. Address Box 204, IRON TRADE REVIEW, Cleveland.

CHICAGO REPRESENTATION

Engineer, with wide acquaintance among consumers in the metal trades and among contractors in this district invites correspondence with manufacturers concerning the sale of their products in this territory. Address Box 208, IRON TRADE REVIEW, Cleveland.

BLAST FURNACE SUPERINTENDENT with first class ability is open for engagement on short notice. An appointment is solicited. Address Box 199, IRON TRADE REVIEW, Cleveland.

WORKS MANAGER OR GENERAL SUperintendent with broad and successful experience in steel plant, hot and cold strip mills, both in construction and operation, extending to most modern designs and practices. Address Box 225, IRON TRADE REVIEW, Cleveland.

EXECUTIVE:—TEN YEARS EXPERIence in steel foundry. Thoroughly conversant with credits, costs, production and sales. Splendid record and highest references. Available July 1st. Address Box 228, IRON TRADE REVIEW, Cleveland.

Employment Service

THE BEST WAY TO GET A GOOD position in drafting or engineering is to file application direct with some of our clients who are depending on us to get competent and experienced applicants for their vacant positions. Send stamp for blank and list of vacant positions. The Cleveland Engineering Agency Co., Rose building, Cleveland, O.

SALARIED POSITIONS $2,500 TO $25,000 upward; executive, technical, administrative, engineering, manufacturing, professional, managing, financial, etc., all lines. If you are qualified and receptive to tentative offers for a new connection, you are invited to communicate in strict confidence with the undersigned, who will conduct preliminary negotiations for such positions. A method is provided through which you may receive overtures in confidence, without jeopardizing present connections, and in a manner conforming strictly to professional ethics. Send name and address only; preliminary particulars will be sent without obligating or compromising you in any way. R. W. Bixby, Inc., 416 Lockwood building Buffalo, N. Y.

Fill-in and Contract Work

Buyers refer to the cards in this section when they have orders to place for castings, stampings, forgings, screw machine products, patterns, special machinery, jigs, tools, dies, etc.

Rates per Insertion on Yearly Basis 1"—$3.75 : :2"—$7.00 : :3"—$10.00 Rates for Other Spaces Furnished on Request

USE OUR PLANT!

We have a completely equipped plant, centrally located, which is very suitable for the construction and assembling of medium heavy work of any nature. Electric crane equipment throughout the plant. Pattern shop, foundry for making gray iron, semi-steel or bronze castings up to 10 tons in size, machine shop and steel fabricating shop, all at your disposal.

Dictate a letter to us now, telling of your requirements and we will be at your service immediately.

MOLOCH COMPANY
Kaukauna, Wisconsin

MACHINE WORK WANTED

Medium and Heavy

THE LONG & ALLSTATTER CO.
Hamilton, Ohio
POWER PUNCHES AND SHEARS

ALL KINDS STAMPINGS

BLANKING and FORMING
ASSEMBLING WORK

Lindsay Chaplet & Mfg. Co.
Harrison Bldg. Philadelphia, Pa.

We are soliciting

MEDIUM HEAVY WORK

in Fabricated Steel, Steel Tanks, Engines, Pumps and Special Machinery of any kind.

We have one of the best equipped plants in the country for handling medium heavy work. All new and up-to-date equipment served by traveling cranes. Complete pattern shop, gray iron foundry, machine shop and steel fabricating shop.

We are especially interested in a good line of equipment to manufacture.

THE SMITH GAS ENGINEERING CO.
Dayton, Ohio

SPECIAL MACHINERY

built in our well equipped
DAYLIGHT MACHINE SHOP

Special gasoline and steam motors, etc.
Let us figure with you.

LAMMERT & MANN COMPANY
Wood and Walnut Sts., Chicago, Ill.

Aluminum, Brass and Bronze CASTINGS

EVANSVILLE ALUMINUM & BRASS CASTING COMPANY
EVANSVILLE INDIANA

FORGINGS

Upset and Hammered

Permit us to figure on your requirements of forgings.

THE WHEELING AXLE CO.
Wheeling, W. Va.

CASTINGS SERVICE

If you are seeking a shop in your locality with which to place an order for castings and are not quite sure which shops are capable of handling your work, send your blue prints or specifications to IRON TRADE REVIEW (Attention Contract Work Department) and we will be glad to advise you on the matter.

601

Gray Iron Castings

Inquiries for Prices Appreciated and promptly answered

LAURELTON FOUNDRY CO.
Laurelton, Pa.

Pressed Metal Parts

Cannot be excelled for containers, office appliances, lighting fixtures, school desks, picture frames, and almost every variety of article where strength, lightness, durability, and a low price are factors.

Peter Gray & Sons Company
Cambridge, Mass.
"Started 1878 and Growing Yet"

An Investment of great value—

Through an advertisement in the Fill-in and Contract Work Section of IRON TRADE REVIEW you can talk each week to thousands of prospects in the metalworking field, just as though they were in your own office.

Your message placed before this multitude week after week is bound to result in business for you.

An advertisement on this page, therefore, is an investment; not an expense.

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Go after the business through advertising

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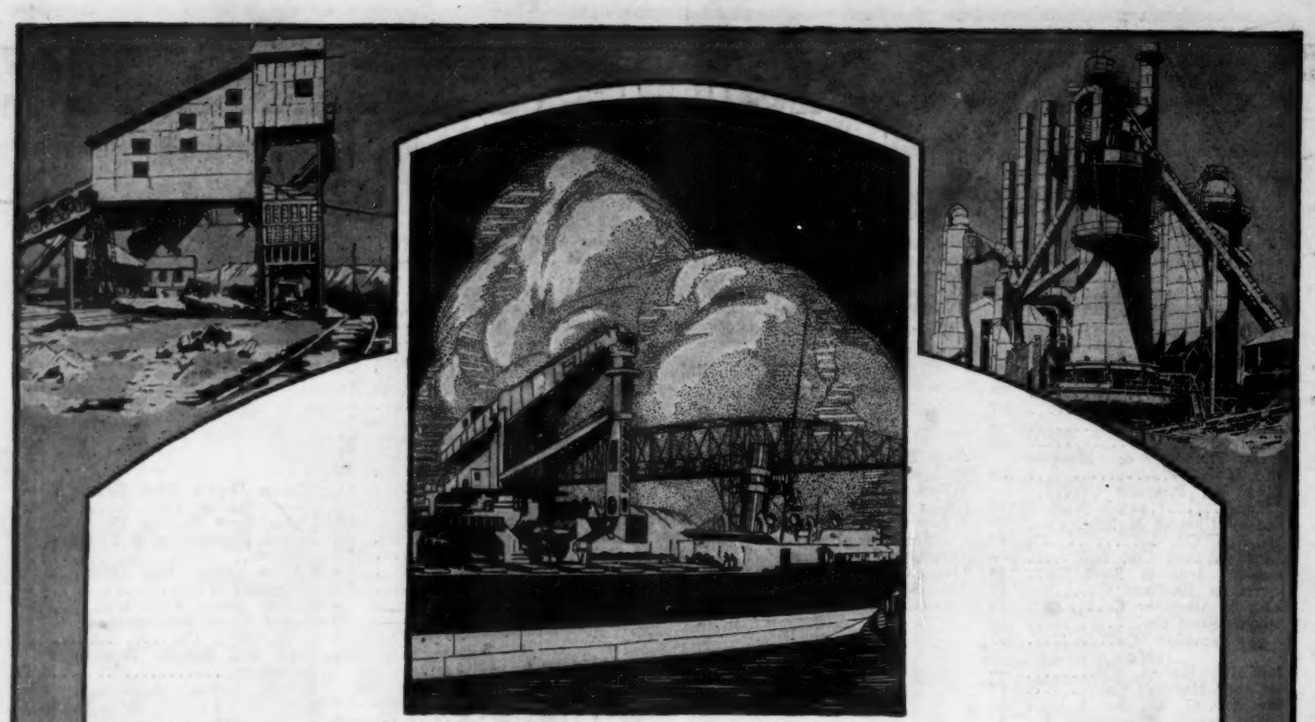

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